JUL 1 3 1982

EP1.2:D 48/3

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-450/2-80-073
June 1980

Air

Regulatory Impact Assessment for the September 5, 1979, Proposed Regulations for Prevention of Significant Deterioration

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EPA-450/2-80-073

Regulatory Impact Assessment for the September 5, 1979, Proposed Regulations for Prevention of Significant Deterioration

by

PEDCo Environmental, Inc.
Durham, North Carolina 27701

Contract No. 68-02-3173
Task No. 1

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Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
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Research Triangle Park, North Carolina 27711

June 1980

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EXECUTIVE SUMMARY

On September 5, 1979, the Environmental Protection Agency (EPA) proposed to revise the June 1978 Prevention of Significant Deterioration (PSD) regulations as a result of the June 1979 summary decision in Alabama Power Company v. Costle (13 ERC 1225). The court issued its final decision on December 14, 1979. In its opinion the court upheld some of the provisions of the June 1978 regulations and overturned others.

The September 5 regulations following the court's mandate proposed several changes to the June 1978 regulations including the definition of potential to emit, fugitive emissions, major modification, and baseline; the requirements for ambient monitoring; and the establishment of preconstruction notice and *De Minimis* levels.

This report presents an assessment of the overall impact of the proposed regulations with respect to several of the major issues or changes in them. This assessment does not attempt to quantify the impact of every issue nor does it attempt to assess the overall economic impact associated with the implementation of the PSD regulations in general. It is designed to provide a relative assessment of the impact of the proposed versus the current regulations in terms of the sources to be affected, their associated emissions, major requirements that must be met or that are no longer required to be met, and the direct costs associated with meeting the additional requirements for sources that would still be subject to PSD.

Since a number of sources would no longer be subject to PSD review, there will be some cost savings for sources as a result of the proposed regulations. Additionally, for those sources that will remain subject to PSD as a result of the proposed regulations, some additional costs would be incurred over and above the costs to implement the current PSD regulations. Finally, there will be costs incurred by sources that will be subject to the new regulations, but would not have been covered under the old.

The analyses conducted in Sections 3, 4, and 5 of this report provide an estimate of the impact of the current versus the proposed PSD regulations, the major issues associated with the proposed PSD regulations, and geographic applicability issues concerning the location of sources within designated nonattainment areas.

The results of this analysis indicate that for the 19 month period covered by the survey of PSD permits there will be an estimated savings of $3.4 to $9.5 million as a result of the proposal for sources that are subject to the current regulations, but which would not be subject to the proposed regulations. If the sources that have received permits from April 1978 to November 1979 are representative of those which will receive permits during the same time period in the future (i.e., 19 months), and there are data to support that they are, then this would represent an annual savings of $2.2 to $6.1 million.

Although there is an overall savings for certain sources that are subject to the current PSD regulations, the proposed regulations would subject some additional sources to PSD review that are not subject to PSD review at this time. These would be modified sources with uncontrolled emissions of less than 100 or 250 tons per year, depending upon whether the source is on the list of 28 source categories, and controlled emissions of greater than 10 tons per year but less than 100 or 250 tons per year. Based on the best estimates available, approximately 1200 additional modifications would be subject to PSD review per year based on the proposal. Since these sources are not now subject to PSD review, they would be required to prepare a PSD permit, conduct the necessary air quality impact assessments, incur some delays in construction as a result of undergoing PSD review in addition to State New Source Review (NSR), and install Best Available Control Technology (BACT) instead of just meeting the emission limits required by the State Implementation Plan (SIP) or New Source Performance Standards (NSPS), as applicable.

As a result of the additional cost incurred by the sources not currently subject to PSD, the overall cost as a result of the proposed regulations represents an increase of approximately $20 to $36 million per year. Based on the total number of sources that would be subject to the proposed regulations (1382), this additional cost would average approximately $14,500 to $26,000 per source. If, however, the current proposal is modified to increase the proposed *de minimis* emission levels to levels being discussed as of this writing (25 tons/yr for total suspended particulate; (TSP); 40 tons/yr for HC, SO_2, NO_x; 100 tons/yr for CO), the additional costs would be reduced by approximately 35 percent, with the total additional cost equal to approximately $12 to $24 million per year. Based on the number of sources that would be subject to these modified levels (1052), this would amount to approximately $12,000 to $23,000 per source. The assumptions and the data used to obtain the above estimated costs are outlined in Sections 3 and 4 for sources currently subject to PSD review, and Appendix B for sources not currently subject to PSD review. A summary table of the cost impacts is presented after the following discussion.

DATA BASE USED IN THE ASSESSMENT

Since the current PSD regulations have been in effect since March 1, 1978, and a number of PSD permits have been issued under these regulations, it seemed reasonable that an assessment of the impact of the proposed regulations should center on those sources that have been issued PSD permits. The assessment, however, does include an estimate of the sources that were currently not subject to PSD, but which would be subject to PSD as a result of the September 5 proposed regulations.

Detailed data were collected on 471 of the 604 permits that had been issued by certain EPA Regional Offices (III-X) from April 1, 1978, to November 1, 1979. Regions I and II were not included in the survey because of the relatively low level of PSD activity in these regions.

COMPARISON OF CURRENT AND PROPOSED PSD REGULATIONS

The current and proposed regulations were compared in terms of the following:

1. The numbers and sizes of sources to be affected by the current and the proposed regulations
2. The change in total emissions likely to result from the proposed regulations
3. The amount of increment likely to be consumed by sources that are no longer subject to PSD review as a result of the proposed regulations
4. The estimated cost savings by sources no longer subject to PSD review as a result of the proposed regulations
5. The estimated cost of meeting BACT for sources that were not previously subject to PSD but which would be subject as a result of the proposal
6. The estimated costs of modeling and monitoring under the current and the proposed regulations.

Of the 604 PSD permits that were issued in Regional Offices III through X, approximately 150(35%) of the new sources and 133 (76%) of the modified sources would be subject to review under the proposed regulation. Sixty-five percent of the new sources and 24 percent of the modified sources that have been issued permits would no longer be subject to PSD based on the September 5, 1979, proposed PSD regulations. The major reason that these new and modified sources would no longer be subject to PSD review is that the definition of potential emissions was proposed to be changed from uncontrolled to controlled emissions. Although several other changes to the regulations had an effect on the number of sources subject to review (i.e. exclusion of fugitive emissions for some source categories, excluding the limitations on the hours of operation, etc.), the major impact was due to the change in the definition of potential emissions.

Certain cost savings would be realized if new and modified sources are no longer required to obtain a PSD permit, apply BACT, and conduct preconstruction monitoring or air quality assessments. Other sources, however, would be required to meet some additional PSD requirements that they were not previously required to meet. In addition, some sources currently not subject to PSD review would be subject to PSD as a result of the proposal. Therefore, some additional costs would be incurred as a result of the September 5, 1979, proposal. These requirements and the associated costs or impacts are summarized below.

REQUIREMENT TO OBTAIN A PERMIT

A total of 205 permits were reviewed that would not be subject to PSD review as a result of the proposal and that could be assigned a review time. The average review time was about 6½ months per application, which includes time to obtain a State permit. Since each source that would not be subject to PSD review would still be required to obtain a State NSR permit, the actual time associated with just the PSD review process was determined to be 5½ months. Based on information obtained regarding the costs due to delay in obtaining a PSD permit, the estimated cost savings associated with sources that would no longer be required to obtain a PSD permit is $4.4 million per year. In addition, approximately 1200 additional sources per year would be required to obtain a PSD permit that were not previously required to obtain one, and this would amount to an additional cost of $6.9 million per year. Therefore, there will be an increased cost of $2.5 million per year for permitting.

BEST AVAILABLE CONTROL TECHNOLOGY

Of the new or modified sources not subject to the proposed regulations, approximately 68 percent have controlled emissions less than 50 tons per year and under the current regulations were not required to conduct a case-by-case assessment of BACT. These sources were only required to meet the applicable NSPS or SIP limit. Therefore, they would not gain any cost savings as a result of the proposed PSD regulations in terms of not being required to apply BACT.

Of the 96 sources not subject to the proposed regulations with controlled emissions greater than 50 tons per year, 65 sources would be subject to an applicable NSPS limit. A review of the NSPS limits as compared with the BACT limits for these sources did not indicate any significant difference between these emissions levels, and therefore these sources would not incur any savings as a result of not being subject to the BACT requirements.

The remaining 31 sources that did not have an applicable NSPS limit could relax their controls to the SIP levels since they would no longer be required to apply BACT. Based on a limited survey of control cost associated with meeting a BACT versus an SIP limit, an overall cost savings for the 19 month period covered by the survey of $3 to $6 million was calculated for sources that would no longer be required to apply BACT. ($1.9 to $3.7 million/yr savings.)

Although certain sources would no longer be subject to PSD review, others that were not subject would now be subject and would be required to apply BACT. Based on the estimates contained in Section 4.3 and the information on the percentage of sources in which BACT is significantly different than the SIP limit, the additional cost of BACT for sources not currently subject to PSD would be on the order of $12 to $24 million per yr.

MODELING

Since some sources would no longer be subject to the PSD regulations, they would not be required to conduct an assessment of the air quality impact. Based on the number of sources that would no longer be subject to review and the level of modeling that would have otherwise been required, there would be a cost savings for certain sources amounting to a total of $0.9 million per yr. However, because some additional sources, would be subject to review that were not previously subject to review and these sources would be required to conduct some additional modeling, the total cost as a result of modeling would actually represent an increase of $0.9 million per yr.

MONITORING

The cost of preconstruction monitoring under the current regulations was calculated by using information on the number of monitors and type of monitoring that was conducted under the current regulations obtained from the permit files, and multiplying by the costs of monitoring. These costs were calculated by using the latest equipment and network costs currently available. The cost associated with the current regulations was approximately $0.3 million per yr. However, only about 5 percent of the sources surveyed indicated that they had established a preconstruction monitoring network. The other 95 percent used existing State or local agency monitoring data. If the same percentage of sources use existing monitoring data in the future that used it in the past, the cost of monitoring as a result of the proposed regulations would be $0.6 million per year or a $0.3 million per year increase. If, however, all sources that would be subject to the proposed regulations would establish their own monitoring networks in lieu of using existing State or local agency data, the additional cost would amount to approximately $7.7 million per yr.

Since postconstruction monitoring may now be required for certain sources, this would amount to an additional cost of approximately $2.3 million per year if certain sources such as large power plants and smelters would be required to establish and operate postconstruction monitoring networks.

FUGITIVE EMISSIONS

Very little, if any, information regarding fugitive emissions was contained in the PSD permit files. Generally, sources did not provide any special mention of fugitive emissions except in those cases in which fugitive dust emissions were involved. Because of this lack of information on fugitive emissions, very little in the way of a quantitative assessment could be undertaken. Based on the limited data available in the PSD permits, only one major source category appears to be affected by the inclusion of fugitive emissions in terms of applicability for sources on the list of source categories published in the September 5 proposal. Although some other source categories produce emissions in quantities greater than 100 tons per year that could be considered fugitive emissions under the proposed definition, these emissions are currently listed as process emissions. Since these source categories are listed as those for which fugitives should be considered in terms of applicability, it does not matter under the proposal how the emissions are classified in terms of applicability. If the proposal would be changed, however, so that fugitive emissions would not be included in terms of applicability for certain sources on the list of 28 and some of the current emissions classified as process are redefined as fugitives, there could be situations in which these sources would no longer be subject to PSD review. This would not be the situation in all cases as some of these sources may have facilities that would have stack emissions in excess of 100 tons per yr and therefore the source would still be subject to review.

For most new sources, either the stack emissions are significantly above the 100 or 250 tons per year cutoff or the source had no apparent fugitive emissions at all. Thus, including or excluding fugitive emissions does not appear to have a major impact on new sources. It may, however, have more of an impact on major modifications not subject to the current regulations. Existing sources, although not really increasing their stack emissions, could modify their facility so that fugitive emissions (e.g., the replacement or addition of valves or pumps, or the addition of a new storage pile or materials-handling operation) would be above the proposed *de minimis* levels and could be subject to PSD review. No data are currently available that would indicate the magnitude of this impact. However, it could be substantial, since many minor modifications could emit fugitive emissions above the proposed *de minimis* levels.

DE MINIMIS EMISSION LEVELS

The *de minimis* emission levels affect sources in two ways. The first is that they determine whether a proposed modification at a major stationary source would be subject to PSD review. The second is that once a source (either new or modified) is subject to review, they determine whether a source will be required to install BACT, conduct an air quality assessment, and include preconstruction monitoring data for all pollutants it emits in excess of the *de minimis* levels.

Although the *de minimis* levels are pollutant specific, very few sources emit just one pollutant. In other words, although a source may no longer be subject to review for TSP because it had net emission changes of less than 10 tons per year, it could still be subject to review under the proposal because it had changes in SO_2 emissions of 20 tons per year. Information on the 151 modifications included in the 471 permits that were reviewed in detail were evaluated and categorized according to the greatest amount of emissions for any of the criteria pollutants that would be emitted from the source as a result of a net change in emissions. Data from this analysis indicate that approximately 87 percent of the modifications would be greater than 10 tons per yr and approximately 68 percent of the modifications would be greater than 40 tons per yr for some pollutants. If the same general emissions distribution of modifications that have received PSD permits holds true for those 1200 modifications that were not previously subject to review, but which would be subject based on the proposal, then approximately 800 additional modifications would be subject to review if the proposed *de minimis* levels would be changed from 10 to 40 tons per yr across the board for all pollutants. If however, various *de minimis* levels are promulgated (for example, 25 tons/yr for TSP, 40 tons/yr for VOC, SO_2, NO_x; and 100 tons/yr for CO), then based on the information from the 151 modifications that have received permits, about 890 additional modifications would be subject to review.

In terms of the number of BACT and air quality reviews that would be required once a source is subject to review, data from 226 PSD permits were abstracted and an analysis conducted to determine how many BACT and air quality reviews would be required under the current proposal as compared with selected alternative levels. Based on the information available, if the current *de minimis* levels are doubled, the number of BACT and air quality reviews for TSP, SO_2, and NO_x would be reduced by 24, 8, and 6 percent, respectively. The amount of TSP, SO_2, and NO_x emissions subject to review, however, would only be reduced by 3, 0.1, and 0.03 percent, respectively. If on the other had various *de minimis* levels are promulgated (for example, 25 tons/yr for TSP; 40 tons/yr for SO_2, NO_x, VOC; and 100 tons/yr for CO), then based on the information available, the number of BACT and air quality reviews for TSP, SO_2, NO_x, and VOC would be reduced by approximately, 35, 25, 21, and 41 percent, respectively. The amount of TSP, SO_2, NO_x, and VOC emissions subject to review, however, would only be reduced by 5, 0.3, 0.2, and 4 percent, respectively.

NONATTAINMENT AREAS

Of the 604 permits issued under the current regulations, 73 permits were for sources located in nonattainment areas. Thirty-four of these sources would have controlled emissions less than 100 or 250 tons per yr or the *de minimis* levels (as applicable), and therefore would not be subject to either the nonattainment or the PSD requirements and would therefore realize some control cost savings. The remaining sources would either be subject to PSD or nonattainment review depending on the pollutants they emitted and the designation of the area for that pollutant. A source was considered to be subject to nonattainment review and therefore not subject to PSD review if it proposed to locate in an area designated as nonattainment for all the pollutants that it emitted. If it emitted any other pollutants that were designated as attainment, it was considered to be still subject to PSD for those pollutants.

Of the permits in the survey, 39 sources would no longer be subject to PSD for a number of the pollutants for which they were major emitters. In some cases the source will still be subject to PSD for some of the major pollutants because the area is designated as an attainment area for these pollutants. Of these 39 sources, only 8 had applied the Lowest Achievable Emission Rate (LAER) as required under the nonattainment NSR provisions. The other 31 sources did not indicate that they had applied LAER, but would be required to do so under the proposed regulations. Therefore, these sources would be required to incur some additional control costs as a result of applying LAER.

Although the 34 sources that would no longer be subject to PSD review and/or nonattainment review would obtain some cost savings as a result of the proposed regulations, the 31 sources that would now be subject to the more restrictive nonattainment requirements would incur some additional costs. The number of sources no longer subject to review is very close to the number that would receive additional review, and the type of sources are very similar in each case. Therefore, it was assumed based on the limited data available, that the overall cost as a result of geographic applicability in terms of nonattainment areas would be the same under the current and proposed requirements since the total savings under one would be offset by the additional costs imposed by the other.

SUMMARY OF THE ASSESSMENT OF THE SEPTEMBER 5, 1979 PROPOSED PSD REGULATION

Regulations (alternative)	Number subject per year		Number not subject per year		Cost, 10^6 dollars/year									
	New	Modified	New	Modified	Additional modification subject per year	Modeling	Preconstruction monitoring	Postconstruction monitoring	Permit preparation	Review time	Preconstruction notice	No longer subject to BACT	Additional BACT	Total
Current[a]	268	113				3.9	0.3		3.0 to 6.2					
Proposal based on current permits[a]	95	84	163	26		3.0	0.6- 8.0	2.3	1.4 to 2.9	-4.4	0.1	-1.9 to -3.7		
Difference compared with current						-0.9	0.3- 7.7	2.3	-1.6 to -3.3	-4.4	0.1	-1.9 to -3.7		-2.2 to -6.1
Proposal based on all sources[b]	95	84			1200	4.8	0.6- 8.0	2.3	6.6 to 8.1	2.5	0.1	-1.9 to -3.7	12.0 to 24.0	
Difference compared with current						0.9	0.3- 7.7	2.3	1.9 to 3.6	2.5	0.1	-1.9 to -3.7	12.0 to 24.0	19.8 to 35.7
Modified *de minimis* levels based on all sources	95	69			888	4.3	0.6- 8.0	2.3	5.2 to 6.7	0.8	0.1	-1.9 to -3.7	8.2 to 16.4	
Difference compared with current						0.4	0.3- 7.7	2.3	0.5 to 2.2	0.8	0.1	-1.9 to -3.7	8.2 to 16.4	12.4 to 24.5

[a] Current permits are those contained in the survey of PSD permits issued from April 1, 1978, to November 1, 1979, calculated on a yearly basis (604 x 12/19 = 381), and are representative of the type and number of sources that would receive permits in the future. The total of the number of sources subject plus the number of sources not subject based on the proposal does not equal the total number of sources subject under the current regulations because 22 sources (13 sources when converted to a yearly basis 22 x 12/19 = 13) could not be categorized in terms of applicability based on the data obtained during the survey of the permits.

[b] All permits include those contained in the survey of PSD permits issued from April 1, 1978 to November 1, 1979, and other sources not currently subject to PSD that would be subject based on the proposal.

[c] TSP = 25 tons/year
SO_2, NO_x, HC = 40 tons/year
CO = 100 tons/year

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ACKNOWLEDGMENT

This report was prepared for the U.S. Environmental Protection Agency, Control Programs Development Division, Research Triangle Park, North Carolina, by PEDCo Environmental, Inc., Cincinnati, Ohio.

The project was directed by Mr. William Kemner, and managed by Mr. David Dunbar. Principal authors were Mr. David Dunbar, Ms. Barbara Blagun, Mr. Larry Gibbs, Mr. Joe Carvetti, and Mr. Jack Wunderle.

Mr. James Weigold was the project officer for U.S. EPA, and his guidance and cooperation were greatly appreciated. The authors thank Messrs. Mike Clowers, Gary McCutchen, Michael Truta, Warren Peters, and Alex Cristofaro of EPA for their cooperation and assistance in completing this effort. Special thanks go to the Regional Office new source review contacts, who made the PSD files and space available to PEDCo to complete the survey of PSD permits as quickly as possible.

SECTION 1

INTRODUCTION

In 1974, the Environmental Protection Agency (EPA) promulgated regulations to prevent particulate matter (PM) and sulfur dioxide (SO_2) emissions from significantly deteriorating the air quality in areas where PM and SO_2 air quality levels were lower than the applicable National Ambient Air Quality Standards (NAAQS's). These regulations required that new or modified source construction be prohibited unless the source could demonstrate that it had applied the Best Available Control Technology (BACT) for PM and SO_2 and that its emissions would not cause significant deterioration of air quality.

On August 7, 1977, the President signed the 1977 Amendments to the Clean Air Act (the Act) into law, and thus established new prevention of significant deterioration (PSD) requirements, which basically follow the outline of the 1974 regulations but are more stringent.

On June 19, 1978, EPA amended the 1974 regulations to make them consistent with the 1977 Amendments. Many industrial and environmental groups petitioned the U.S. Court of Appeals of the District of Columbia Circuit to review substantive portions of the June 1978 revised regulations.

On June 18, 1979, in The Alabama Power Company v. Costle (13 ERC 1225) case, the court issued a decision that upheld some of the provisions of the June 1978 regulations and overturned others. In its opinion, the court summarized its ruling, and promised a supplemental, comprehensive opinion at a later date. (The court issued its final opinion on December 14, 1979.) On September 5, 1979, following the court's mandate, EPA proposed certain changes in the June 19, 1978, regulations to make the PSD requirements consistent with the June 1979 summary decision in Alabama Power. The proposed changes included:

1. Potential to emit
2. Fugitive emissions
3. Major modification
4. Preconstruction notice
5. Baseline definition
6. Ambient monitoring
7. *De minimis* levels.

Each of the above changes under the proposed regulations is discussed below.

Potential emissions would be determined after application of emission controls, and would be calculated using maximum annual rated capacity, year-round hours of operation, and any enforceable permit condition on the material combusted or processed.

Fugitive emissions would be excluded from a source's annual potential emissions unless these emissions are from the industrial source categories listed in the proposed regulations.

Major modifications would be exempted on a pollutant-by-pollutant basis from PSD review if the emission levels are less than the *de minimis* levels. An exemption would also be granted if there are sufficient emission reductions to offset the emission increase caused by the modification, so that no significant net increase in emissions would result.

A written preconstruction notice to the reviewing authority would be required (instead of a permit) from the following:

1. Construction not qualifying as a major modification because of sufficient offsetting emission reductions

2. A source with emission reductions to be used for future offsets

3. Construction not qualifying as a major source because of application of controls more stringent than those required by the State Implementation Plan (SIP), New Source Performance Standards (NSPS), or National Emission Standards for Hazardous Air Pollutants (NESHAPS).

The September 5, 1979 proposal revised the definition of baseline and established the baseline date as the time of the first completed permit application, after August 7, 1977, within an Air Quality Control Region (AQCR) designated as either attainment or unclassified.

More ambient monitoring would be required before and after construction as a result of the proposal, for all pollutants regulated under the Act--not just the criteria pollutants.

The regulations also proposed to exempt, on a pollutant-specific basis, major modifications and new sources from all requirements if the emissions of a specific pollutant are below the *de minimis* level. The *de minimis* air quality levels are to be used as guidelines for exempting sources from PSD air quality analysis on a pollutant-specific basis if the emissions are above the proposed *de minimis* emission levels.

At the time of the September 5, 1979, proposal, EPA had not conducted an assessment of the impact of the proposed changes to the PSD regulations. The Act (Section 317) requires an impact assessment of regulations and revisions to regulations issued under Part C of the Act (PSD). Executive Order 12044 similarly requires an impact assessment of significant regulatory actions.

Section 317 of the Act indicates that this assessment should contain an analysis of the following:

1. Cost of compliance

2. Potential inflationary or recessionary effects

3. Effects on competition with respect to small businesses

4. Effects on consumer costs

5. Effects on energy use.

Section 317 also states that the assessment shall be as extensive as practicable, taking into account the time and resources available to EPA.

This report presents an assessment with regard to the overall impact of the revised regulations and several of the major issues and or changes outlined above. This assessment does not attempt to quantify the impact of every issue nor does it attempt to assess the overall economic impact associated with the implementation of the PSD regulations. It is designed to provide a relative assessment of the impact of the proposed versus the current regulations in terms of the sources to be affected, their associated emissions, major requirements that must be met or that are no longer required to be met, and the direct costs associated with meeting the additional requirements for sources that would still be subject to PSD.

SECTION 2

DATA BASE USED IN THE ASSESSMENT

To assess the impact of the September 5, 1979, proposed PSD regulations as compared with the current June 19, 1978, PSD regulations, the number of sources to be affected by each set of regulations had to be obtained. Since the current regulations have been in effect since March 1, 1978, and since PSD permits have been issued under these regulations, it seemed reasonable that an assessment of the impact of the proposed regulations should be centered on the sources that have been issued PSD permits and on sources that are in varying stages of PSD review.

Final permits (approved and issued) and pending permits (waiting to be approved) represent individual proposed sources with specific sizes, locations, and impacts. Though typical hypothetical sources (or model plants) were used for the impact assessment of the current regulations, actual source data in the EPA Regional Office files were used for the assessment of the September 5 proposed regulations. The actual rather than the hypothetical source data were used because it was determined that the sources that had been issued permits to date represented a reasonable cross section of sources that would have been subject to the current PSD regulations over the past year or so and which would be subject in the future. Additionally, this was the only source of data available that was of sufficient detail to assess whether certain sources would still be subject to PSD and what would be the associated impact.

Because a number of issues must be evaluated regarding the proposed regulations, certain information was necessary in order to conduct the evaluation. This information was summarized by issue, and a summary form or table was designed to abstract the data from individual PSD files. A copy of this table or form is shown in Figure 1.

2.1 REGIONAL OFFICE SURVEY

Each EPA Regional Office (RO) was contacted to obtain a list of sources for which permits were pending or approved. These lists were first summarized by source category and then reviewed to determine which Regional Offices would be visited. Since only a

SEPTEMBER 5, 1979 PSD ASSESSMENT

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Source Type/Size:____ EPA RO___PEI NO.___________

Name/Mail Add.:____ County___________________

Located In: ATT/NA area of AQCR No._____at UTM______________________________________and impacts ATT/NA area

Determination is: CONDITIONAL/FINAL/PENDING for NEW/MODIFIED/RECONSTRUCTED/REPLACEMENT Source.

Key Dates: Application-Recd.__________, Completed__________; Determination-Proposed__________, Final__________

	"A"-EMISSIONS - ton/yr								"B"-PERMIT CONDITION ON:		
			At capacity		Allowable under:						
Affected Facilities (Name and Number)	Type*	Max/PC** capacity	Uncontr.	Contr.	BACT	SIP	NSPS or NESHAPS	LAER or other specify	Oper. hours	Fuel type/ amount	Materials type/ amount

"C"- FUGITIVE SOURCES						"D"- AIR QUALITY IMPACT			"E"- MONITORING NETWORK		
		Dust-ton/yr		Emissions-ton/yr							
(Name and Number)	Type*	Uncontr.	Contr.	Uncontr.	Contr.	Type*	Max. Conc. $\mu g/m^3$	km from source	Start Date	Type*	No. Monitors

* Specify pollutant - use PM, SO_x, NO_x, HC, CO, Pb for NAAQS; Hg, Be, As, VCl for NESHAPS; SA, TRS, RCS, Fl for NSPS

** If source operates at other than maximum capacity due to permit conditions - circle "PC", insert details at "B" and complete "A" based on "permit capacity."

Figure 1. Summary form for September 5, 1979 proposed PSD regulations.

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"F"- CONTROL EQUIPMENT

CYCLONES: Type__________; Tubes: No.____, D =_____in., L = _____ft; ΔP = ___in. H_2O; Inlet Vel. = ___ft/s;
(Source No.___) Volume =____________SCFM: Eff. = ____%; Other:________________
ESP Type______________; Total plate area = _______ft^2; SCA =_______ft^2/1000 ACFM; L/W ratio = _______
(Source No.___) Linear vel. = _______ft/s; Volume________SCFM; Eff. ___%; Other________________
FABRIC FILTER: Type_____________Cleaning Mode:___________Fabric:______________ ΔP = _______in. H_2O;
(Source No.___) Filter vel. (A/C) =_____ft/s; Volume =________SCFM: Eff._____%; Other________________
SCRUBBER: Type________________; L/G = _______ gal/1000 ACFM; ΔP =____in. H_2O; Liquid used______________
(Source No.___) Volume =__________SCFM: Eff. = ____%; Other________________
AFTERBURNER: Temp. = _______°F; Residence Time =_____s; L/D:___Volume = ________SCFM; Eff. = _____%
OTHER TYPE CONTROLS/REMARKS/ETC.________________

"G"- CONTROL COSTS

Source No.	System Cost-$\$x10^3$ Cap:	Oper:

"H"- EMISSIONS CHANGE SINCE 8/7/'77-ton/yr

Source	Type*	Increase	Decrease	Net

"I"- STACK DATA

Source No.	No. of stacks	Diam. -ft.	Ht. -ft.	Temp. -°F	Exit vel. -fps

NOTES, REMARKS, ETC. ________________

"J"- FUEL USE

Type__________;_____% A; _____% S
HV____________BTU/lb-gal-CF
Annual Use Rate:______________

"K"- AIR QUALITY MODELING

Pre-screening____Screening____
Detailed/Type______________

Figure 1 (continued)

few PSD permits had been issued for Regional Offices I and II under the current regulations, and the data to be obtained were expected to be limited, it was determined that Regional Offices I and II would be excluded from the survey. This decision was reinforced when it was learned that these files did not have any unique sources that would not be included by surveying the other eight regional offices.

Each Regional Office was contacted, and dates were arranged for reviewing the files and abstracting the data.

RO	12/79	RO	12/79
III	05-07	VII	03-07
IV	11-14	VIII	10-12
V	04-07	IX	10-14
VI	03-07	X	20-21

Of the 604 PSD permits issued to date, data on 471 permits were collected in RO's III through X. However, some of the data needed for completing certain parts of the assessment were unavailable. Therefore, the data abstracted onto the summary forms were reviewed, and efforts were undertaken to either supplement or upgrade the data.

2.2 FINAL PERMIT REVIEW

Assessment of the impact of the proposed regulations was centered on the final PSD permits because these data had been reviewed as part of the public comment process and had been approved by EPA as representing the final emissions and air quality impacts associated with particular sources.

As of November 1, 1979, approximately 604 sources had been issued permits by EPA under the current PSD regulations for Regions III through X during the 19 months from April 1, 1978, to November 1, 1979. (Thirty other sources had been issued permits in Regions I and II, bringing the total to 634.) Table 1 lists the final permits by source categories for Regions III through X. As shown, large numbers of permits had been issued for coal-cleaning or preparation plants and for asphalt batch plants. Because many of these plants were similar in size and emissions and the resources available to complete the assessment were limited, only a subset of these two categories were included in the detailed survey, and no more than 10 sources in each of these two source categories per Regional Office were included in the detailed survey. The sources not reviewed in detail were included in the assessment of the number of sources subject to the proposed versus the current regulations by assuming that these sources would be subject or not be subject to the proposed regulations in the same proportion as those that were reviewed in detail. Other portions

TABLE 1. PSD PERMITS ISSUED BY EPA REGIONAL OFFICES III-X, APRIL 1978 TO NOVEMBER 1979

Source category	Source type		
	New	Modified	Total
Fossil fuel-fired steam generator (>250x10^6 Btu/h)	19	2	21
Coal-cleaning plant	60	3	63
Portland cement plant	6	6	12
Primary zinc smelter			
Iron and steel mill plant	11	5	16
Primary bauxite smelter			
Primary copper smelter			
Municipal incinerator	1		1
Hydrofluoric acid plant		1	1
Sulfuric acid plant			
Nitric acid plant	1		1
Lime plant	11	4	15
Petroleum refinery	12	20	32
Coke oven battery	2	3	5
Phosphate rock processing plant			
Sulfur recovery plant	3		3
Carbon black plant	1	2	3
Primary lead smelter			
Secondary metal production plant	11	6	17
Chemical process	13	12	25
Industrial boiler (>250x10^6 Btu/h)	22	12	34
Petroleum storage and transfer units	9	2	11
Taconite ore processing plant			
Kraft pulp mill	2	7	9
Glass fiber processing plant	7	3	10
Charcoal production plant	1		1
Fuel conversion plant	7	5	12
Sintering plant			
Asphalt batch plant	71	24	95
Rock crushing	12	5	17
Natural gas compressor	9	7	16
Mining	15	4	19
Turbine	9		9
Other	110	46	156
Total	425	179	604

of the assessment, however, did not include these sources because sufficient information on emissions, air quality impact, etc., were not available to permit these sources to be included. Therefore, with the exception of the total number of sources subject versus not subject, the assessment for the most part unless otherwise noted, was based on the data for the 471 sources for which detailed information was obtained.

A review of the issued permits over the above 19-month time period indicated that a good cross section of industrial sources would be included in the assessment. Additionally, because there were no unique economic conditions prevailing during this time period that would substantially affect any of the source categories, this sample of final permits was assumed to be a reasonable approximation of the sources and source categories that would be affected by PSD during a similar time period in the future. This assumption was further verified by reviewing a listing of pending permits currently being processed by EPA.

2.3 PENDING PERMIT REVIEW

According to the information obtained from the EPA Regional Offices, approximately 600 PSD permit applications were in various stages of review as of November 1, 1979. The distribution of pending permits for Regional Offices III through IX (Table 2) and final permits (Tables 1 and 3) were similar within Regional Offices and among source categories.

A detailed survey of pending permits was not undertaken for two reasons: (1) the pending permits were in various stages of review; therefore no firm estimates of the emissions of air quality impact could be obtained; for most sources, negotiations were ongoing to decide the level of control that would be considered as BACT and to decide which models and conditions should be used in the final assessment of the air quality impact associated with the proposed new or modified source, and (2) only limited resources had been allocated for the survey portion of the assessment, so only a limited number of permits could be included in the data base for a detailed assessment. Even though a detailed survey was not conducted for all sources with pending permits, some pending permit data were included in the assessment. This included a coal gasification facility and an oil shale project.

TABLE 2. PSD PERMIT APPLICATIONS PENDING IN EPA'S REGIONAL OFFICES III-IX, APRIL 1978 TO NOVEMBER 1979

Source category	III	IV	V	VI	VII	VIII	IX	Total
Fossil fuel-fired steam generator >250x10^6 Btu/h	2	7	7	5	2	5	2	30
Coal-cleaning plant	8	29	3				1	41
Portland cement plant	1	2		2	1	5	1	12
Primary zinc smelter								
Iron and steel mill plant	5		3	2			1	11
Primary bauxite smelter								
Primary copper smelter								
Municipal incinerator		2						2
Hydrofluoric acid plant								
Sulfuric acid plant		1						1
Nitric acid plant								
Lime plant	1	1	2	1	3			8
Petroleum refinery	4	3	1	23	9	2	7	49
Coke oven battery			2					2
Phosphate rock processing plant		1						1
Sulfur recovery plant								
Carbon black plant				1				1
Primary lead smelter	1							1
Secondary metal production plant	1	4	2	2	2	1		12
Chemical process	4	14	5	18	1		1	43
Industrial boiler >250x10^6 Btu/h	8	12	7		3	1	1	32
Petroleum storage and transfer units		4					2	6
Taconite ore processing plant								
Kraft pulp mill		1		1				2
Glass fiber processing plant								
Charcoal production plant		1						1
Fuel conversion plant		1				4		5
Sintering plant								

(continued)

TABLE 2 (continued)

Source category	III	IV	V	VI	VII	VIII	IX	Total
Asphalt batch plant	6	17		2	7	1		33
Rock crushing	2	5	1		3	1		12
Natural gas compressor		2	2	9	2	7	10	32
Mining		1	1			18	1	21
Turbine			2		5		1	8
Other	10	41	20	30	10	9	23	143
Total	53	149	58	96	48	54	51	509
Percentage	10.4	29.2	11.3	18.8	9.4	10.6	10	

TABLE 3. PSD PERMITS ISSUED BETWEEN APRIL 1, 1978, AND NOVEMBER 1, 1979

	I	II	III	IV	V	VI	VII	VIII	IX	X	Total
Number	1	29	62	253	41	95	18	43	90	2	634
Percentage	0.1	4.5	9.8	39.9	6.5	15.0	2.8	0.7	14.2	0.3	

SECTION 3

COMPARISONS OF CURRENT AND PROPOSED PSD REGULATIONS

Current and proposed regulations were compared in terms of the following:

1. The numbers and sizes of sources to be affected by the current and the proposed regulations
2. The change in total emissions likely to result from the proposed regulations
3. The amount of increment likely to be consumed by sources that are no longer subject to PSD review as a result of the proposed regulations
4. The estimated construction cost savings as a result of sources no longer subject to PSD review as a result of the proposed regulations
5. The estimated cost savings as a result of sources which would no longer be subject to BACT
6. The estimated cost of meeting BACT for sources that were not previously subject to PSD but which would be subject as a result of the proposal
7. The estimated costs of modeling and monitoring under the current and the proposed regulations.

3.1 GENERAL COMPARISON OF CURRENT AND PROPOSED PSD REGULATIONS

The PSD preconstruction review requirements apply to any "major emitting facility." This requirement applies to any stationary source which emits or has the "potential to emit" 100 tons per year or more of any pollutant regulated under the Act for any of the 28 source categories listed below:

Coal-cleaning plants (thermal dryers)
Kraft pulp mills
Portland cement plants
Primary zinc smelters

Iron and steel mill plants
Primary aluminum ore reduction plants
Primary copper smelters
Municipal incinerators

Hydrofluoric acid plants
Petroleum refineries
Lime plants
Phosphate rock processing plants

Coke oven batteries
Sulfur recovery plants
Carbon black plants (furnace process)
Primary lead smelters

Fuel conversion plants
Sintering plants
Secondary metal production plants
Chemical process plants

Fossil fuel-fired boilers (>250 x 10^6 Btu/h)
Petroleum storage and transfer units (>300,000 bbl)
Taconite ore processing plants
Glass fiber processing plants

Charcoal production plants
Fossil fuel-fired steam electric plants (>250 x 10^6 Btu/h)
Nitric acid plants
Sulfuric acid plants

The requirements also include any other source with the potential to emit 250 tons per year or more of any pollutant regulated under the Act.

3.1.1 Potential to Emit

The current regulations define "potential to emit" as the "capability at maximum capacity to emit a pollutant in the absence of air pollution control equipment." Permit restrictions on hours of operation and capacity could be taken into account in calculating potential emissions. However, the proposed regulations (in response to the Court's decision in Alabama Power) define "potential to emit" as the "capability at maximum capacity to emit a pollutant after the application of air pollution control equipment." The proposed regulations further state that the potential to emit shall be based on full design capacity. Thus at least under the proposal, restrictions on the hours of operations and capacity may not be taken into account in calculating potential emissions. However, for comparison, an analysis was undertaken to determine the impact of including restrictions on the hours of operation and on the number of sources that would be subject to review.

The current regulations in general have exempted from full review any major new or modified source that had emissions of less than 50 tons per year, 1000 pounds per day, or 100 pounds per hour--whichever was more restrictive. Under the current 50-ton exemption, a source has not had to install BACT, and has not had to provide an ambient air quality impact assessment. Since under the proposed regulations, no new 50-ton source would ever be major, this exemption was dropped as part of the PSD review process.

3.1.2 Fugitive Emissions

Under the current regulations, fugitive as well as stack emissions are considered in determining whether a source is subject to review for all sources. However under the proposed regulations, fugitive process emissions would be considered along with stack emissions in determining applicability for the following source categories:

Coal-cleaning plants
Kraft pulp mills
Portland cement plants
Primary zinc smelters

Iron and steel mill plants
Primary aluminum ore reduction plants
Primary copper smelters
Municipal incinerators

Hydrofluoric acid plants
Sulfuric acid plants
Nitric acid plants
Petroleum refineries

Lime plants
Phosphate rock processing plants
Coke oven batteries
Sulfur recovery plants

Carbon black plants
Primary lead smelters
Fuel conversion plants
Sintering plants

Secondary metal production plants
Chemical process plants
Fossil fuel-fired boilers
Petroleum storage and transfer units

Taconite ore processing plants
Glass fiber processing plants
Charcoal production plants
Fossil fuel-fired steam electric plants

Any other source category being regulated under Section 111 or 112 of the Act at the time of the applicability determination would also be included.

3.1.3 Geographic Applicability

The current regulations require that new or modified sources be subject to PSD review regardless of location. The proposed regulations (and final court decision), however, would apply only to new or modified sources and pollutants within AQCR's designated as attainment or unclassified.

3.1.4 Major Modifications

The current regulations subject a modified source to review if it is one of the 28 source categories with emission increases above 100 tons per year or if it is any other source with increases above 250 tons per year; associated emission reductions were not allowed to exempt the source from PSD review, but reductions that offset the increase and prevented a net increase were allowed to be used to avoid BACT review. Under the proposed regulations, any modification to a major source would be subject to PSD review if the modification would cause a net increase in the source's potential to emit. The proposal also states that emission increases offset entirely by contemporaneous emission reductions would not be considered a modification. However, if a major stationary source modifies its pollutant emissions so that the net increase in any pollutant would be above the proposed *de minimis* levels, it would be subject to PSD review for all the pollutants it emits above the *de minimis* levels.

3.2 NUMBER OF SOURCES SUBJECT TO PSD REVIEW

As indicated in Section 2 of the 604 permits issued for Regional Offices III through X, only 471 were reviewed in detail. Of those reviewed in detail, 22 permits did not have data suitable for this analysis. Therefore of the remaining 449 permits, 114 (36%) new sources and 118 (76%) modified sources would be subject to the proposed regulations. The figures for modified sources should be viewed with some caution, however. Under the proposed regulations, modifications would be reviewed only if they result in a significant net increase in the emissions from a major stationary source (or would be a major source as a result of the modification). Certainly, some of the modifications included in the survey of the PSD permits were not modifications of major stationary sources at the time that the permit was requested. Therefore, these modifications would not be reviewed under the proposed regulations. Because information on the size of the source that was being modified was not part of the PSD permit file, the number of modifications that would be subject to review represents an upper bound on the number of modified sources subject to the proposed regulations.

If hours of operation or limitations of capacity were considered in determining potential emissions, 108(34%) new sources and 110(71%) modified sources would be subject to the proposed regulations. The calculations to determine the impact of limiting the hours of operations or capacity used the information on actual operating hours or capacity as reported in the permit application. It was assumed that since the source would be operating at these levels, it would agree to limit its hours of operation or capacity to avoid PSD review if permitted to do so under the proposal. Although this may not be the case for all sources, it is a reasonable assumption for the purpose of this analysis.

The most important factor in determining whether a modified source would be subject to the proposed regulations is the *de minimis* levels. Under the current regulations, modified and new sources have the same emission cutoff criteria for determining applicability under PSD. If this current concept of treating modified sources the same as new sources, in terms of general applicability, were used in the proposed regulation, only about 45 percent of the modified sources that have received permits to date would be subject to PSD review. That is, only 45 percent of the modified permits reviewed in detail had potential emission changes after control of greater than 100 tons per year or 250 tons per year as applicable.

If new sources with emissions of 100/250 tons per year or modified sources with emissions greater than *de minimis* levels that are proposing to locate in areas designated as nonattainment were also subject to PSD review, approximately 37 percent of the new sources and 82 percent of the modified sources would be subject to review. In this analysis, a source was considered to be subject to nonattainment review and therefore not subject to PSD review if it proposed to locate in an area designated as nonattainment for all the pollutants that it emitted. If it emitted any other pollutants for which the area was designated as attainment, it was considered to be still subject to PSD for those pollutants and therefore was considered in the calculation of the total number of sources subject to the proposed regulations. It was assumed that if a source was a major emitter of at least one pollutant, even though it was the nonattainment pollutant, all other pollutants above the *de minimis* limits for which the area was designated as attainment would still be subject to PSD review. Twenty-two new or modified sources fell into this category. The number of sources subject did not change even if the criteria to subject a source to PSD review was any emissions rather than emissions above the *de minimis* levels for those other pollutants for which the area was designated as attainment. The only change that did result was that for a few of the sources, one or two additional pollutants would now be subject to PSD in addition to the ones they emitted above the *de minimis* levels.

If the 133 permits (604-471) not surveyed in detail were considered to be subject to review in the same proportion as the sources that were surveyed in detail, approximately 150(36%) new sources and 133(76%) modified sources would be subject to review under the proposed regulations. In summary, of the 604 permits issued: 22 could not be classified; 283 (150 + 133) would be subject; and 299 would not be subject to the proposed regulations. (22 + 283 + 299 = 604)

3.3 EMISSIONS FROM SOURCES NOT SUBJECT TO PROPOSED REGULATIONS

Table 4 presents the estimated quantities of emissions that would be emitted by the sources in the sample of 471 permits not subject to the proposed PSD regulations as published. These estimates represent the emission levels in the final PSD permits. Also included in Table 4 are estimates of the total emissions by pollutant from the permits which would be subject to review under the proposed regulations. A review of the table indicates that two values seem out of line with respect to the other values in the table. These values have been noted, and some additional information is provided in footnotes on the table. In terms of the SO_2 values for Regional Office V, 7000 out of the 9000 tons per year are due to the fact that a number of large SO_2 emitters are proposing to locate in a designated nonattainment area for SO_2, and therefore these SO_2 emissions as such would not be subject to PSD review but would be subject to the nonattainment provisions. In addition, with respect to the particulate matter emissions in Regional Office VIII, 20,000 of the 23,503 tons per year are from fugitive emissions from mining operations that would not be included in terms of applicability, and therefore these sources would not be subject to review because they did not have stack emissions that would exceed 250 tons per year.

Many sources no longer subject to the PSD regulations may relax the emission limits recorded in the permits if these limits are significantly more restrictive than the current SIP or NSPS limits. Because estimates of the SIP limits were not contained in the PSD permits in most cases, it was not possible to estimate the total additional emissions that might result from sources relaxing their emission limits from BACT to SIP. However, Section 3.5 provides an assessment on a case-by-case basis as to the additional emissions that might be emitted from selected sources in terms of the applicable NSPS and SIP limits.

3.4 CONSTRUCTION COST SAVINGS AS A RESULT OF SOURCES NOT BEING SUBJECT TO PSD REVIEW

Sources in the sample of 471 permits that have undergone PSD review but which would not be subject to the proposed regulations may have incurred some costs as a result of obtaining a PSD permit that would no longer have to be incurred and would therefore represent a potential cost savings. Applying for a permit for construction of a new or modified source entails several steps:

TABLE 4. EMISSION LEVELS NOT SUBJECT TO PSD REVIEW UNDER PROPOSED REGULATIONS[a]
(Regional Offices III-IX)

RO	TSP	SO_2	HC	CO	NO_x
III	960	693	222	74	83
IV	4,550	628	1,774	375	301
V	2,240	9,729[b]	85	1,613	342
VI	1,943	223	1,054	119	182
VII	816	7	0	5	7
VIII	23,503[c]	1,584	1,452	391	420
IX	1,635	1,717	363	395	1,795
Total	34,648	14,583	4,952	2,974	3,133
Total[d]	58,097	307,760	11,675	79,495	325,071

[a] Emission levels are those associated with the 471 permits surveyed in detail that were issued permits from April 1, 1978 to November 1, 1979 (19 months).

[b] 7000 tons/year are from SO_2 sources that would be subject to nonattainment requirements because the sources are located in designated SO_2 nonattainment areas.

[c] 20,000 tons/year are from mining operations where fugitive emissions are not considered in terms of applicability, and therefore these sources would not be subject to PSD.

[d] Total emissions that would be subject to PSD review as a result of the proposed regulations.

1. Refining the requirements for a permit application
2. Monitoring to collect needed data
3. Preparing and submitting an application
4. Preparing comments and responding to requests for additional information
5. Attending public hearings and responding to public comments
6. Undergoing final review.

Since the impact in terms of the costs associated with several of the key elements necessary to obtain a PSD permit will be discussed in detail in the following sections, this section will address the general cost impact associated with the overall time needed to obtain a permit once a complete application has been submitted.

3.4.1 Typical Number of Days Necessary to Obtain a PSD Permit

A review of PSD permits issued under the current regulations yielded the times shown in Table 5. The numbers in Table 5 represent the average, maximum, and minimum number of days between the receipt of a complete PSD application and the issuance of a final permit for several source categories. The review times were obtained from information contained in regional office permit files. A total of 205 permits were reviewed that would not be subject to the proposed regulations and that could be assigned a review time. The average review time for the 205 permits is 192 days, or about 6½ months per application.

In addition to the need to obtain a PSD permit, State NSR permits are also needed to ensure that the source will meet all applicable State limitations. If it is assumed that the average State review time is 1 month,[1,2,3] the average review time just for PSD reduces to 5½ months. In some cases, the review may be sequential, but in many cases the State NSR precedes the PSD review process.

In addition to the actual time necessary to conduct a PSD review, the following factors may affect the amount of time associated with receiving an approved permit:

1. Obtaining other permits (e.g. for water discharge, hazardous material, solid waste, etc.)
2. Obtaining necessary funding
3. Acquiring property

TABLE 5. NUMBER OF DAYS TO RECEIVE A PSD PERMIT UNDER THE CURRENT REGULATIONS

Source category	Number issued	Days between receipt of application and issuance of final permit		
		Average	Maximum	Minimum
Oil pipeline	1	709	709	709
Natural gas transfer	3	420	489	291
Sulfur recovery	3	365	587	249
Uranium mill	4	286	468	135
Fuel conversion	3	275	376	103
Incinerator	3	267	304	238
Cement plant	2	257	294	219
Charcoal plant	1	247	247	247
Secondary metal	6	244	410	119
Refinery	15	234	428	95
Steam generator	8	232	448	93
Aluminum	2	227	285	168
Lime plant	4	221	372	85
Glass/ceramics/fiberglass	13	220	374	85
Oil separation	2	213	291	134
Feed plant	2	205	233	177
Mining	16	202	498	59
Wood products	9	202	366	83
Boilers	5	196	324	89
Chemical process	14	193	450	98
Truck loading	1	193	193	193
Rock crushing/processing	16	187	377	30
Coal preparation	12	183	417	72
Petroleum storage	10	173	370	65
Iron and steel	22	169	431	35
Mineral/slag processing	11	150	308	72
Asphalt plant	17	149	455	12

4. Purchasing and delivering equipment.

Any one of these items can more than exceed the time normally required to receive a PSD permit.

Depending on the order in which the applicant attempts to pursue the above-required steps, the total construction project leadtime could extend the time for obtaining a permit by several months to a year. For example, if a source applies for a PSD permit early on in the project planning process (e.g., when obtaining funding or acquiring property), then no additional time would be spent on obtaining a PSD permit. If an application for a PSD permit is submitted only after the above steps are taken, however, a project may be delayed by several months.

3.4.2 Estimated Costs

The applicant experiences certain costs as a result of the time imposed by the requirement to obtain a PSD permit. Although a loss of production could cause a loss in income, this is generally not the case for any delay that may be incurred as a result of PSD review, because these delays do not generally reduce the useful life of the equipment and in most cases the production can be made up during later years. However, for example, there could be a loss for sources that recover waste products as usable forms of resources or energy, since the raw materials that are discarded during the delays are not recoverable and if generated on site must be disposed of until the unit is constructed and operational. For example, recovery of municipal waste can yield profits of $6 to $8 per ton.[4] This profit would be replaced by disposal costs, however, if a permit is delayed. Loss of production can also be translated into an additonal cost if an alternative source of the product must be purchased to compensate for loss of capacity; examples are purchased steam (as opposed to waste-generated steam), electric power, and oil and gas supplies.

Energy losses can also be incurred as a result of delays in replacing antiquated, inefficient processing units with modern, energy-efficient units. Replacment of a refinery heater rated at 82 percent efficiency with one rated at 92 percent can reduce fuel use by 12 percent and yet deliver the same heat. Therefore, these could be additional costs that would be associated with any delay in obtaining a PSD permit.

It is very difficult to quantify the actual cost associated with any time delays as a result of the PSD review process. For the source categories in Table 5, the minimum review time is 1 to 3 months; this time probably best represents the actual time necessary to obtain a PSD application, without considering any other factors. This is based on the fact that under the current regulations Tier 1 reviews were estimated to take from 1 to 3 months. The 2-year review time for the oil pipeline is not representative, as the project was highly debated and the permit application later withdrawn.

The estimated cost incurred as a result of obtaining a PSD permit will vary from source to source depending on the size and type of source that is obtaining a permit. Estimates ranged from a total cost of \$8750 to approximately \$2740 per day.[5]

Since the sources that would no longer be subject would be smaller sources (i.e. with controlled emissions less than 100 tons per year or 250 tons per year) and would tend to have shorter review times (i.e. less than 6 months) and therefore incur less overall cost, the lower end of the above range for the cost incurred due to delays in obtaining a PSD permit was used to estimate the cost savings as a result of no longer being subject to PSD review. Since the minimum amount of time that it would take to obtain a PSD permit would be approximately 2 months (1 month review plus 1 month for public comment), the average cost per month using a total cost of \$8750 would be \$4375 (\$8750 ÷ 2 months). Given this cost per month of \$4375 and the average time for PSD review of 5½ months, the potential savings for the 299 sources that would no longer be subject to PSD as a result of the proposal is approximately \$7.1 million (299 sources x 5½ months x \$4375). The \$4375/month seems reasonable for review times of 1 to 6 months since the average cost per month is not expected to be significantly different for review times of 6-month or less. Additionally, this cost seems reasonable if the sources were not required to offset a lack of product with purchases from another supplier. In some cases, however, equipment delivery time exceeds the review time and no additional cost would be incurred.[6]

3.5 COST OF APPLYING BACT

Based on the review of 604 final PSD permits, 258 new and 41 modified sources would not be subject to the proposed regulations. Table 6 lists these sources by categories. Sources no longer subject to PSD would not be required to demonstrate that they had applied BACT to all pollutants with levels above the *de minimis* levels. (The impact of *de minimis* levels on the number of BACT reviews is discussed in Section 4.5.) These sources would be required to meet only an emission limit prescribed by an NSPS, NESHAPS or a SIP. Because a SIP, NESHAPS or NSPS limit is theoretically less stringent than BACT, the source could derive a cost savings by installing equipment with a lower degree of control than currently required by BACT. This cost savings would be a direct result of not being subject to the proposed regulations.

3.5.1 Emissions Less Than 50 Tons Per Year

Some sources not subject to the proposed regulations were not required to apply BACT under the current regulations. If a source subject to the current regulations could demonstrate that its controlled emissions would be less than 50 tons per year, it was not required to demonstrate that it had applied BACT; it had

TABLE 6. SOURCES NOT SUBJECT TO PSD AS A RESULT OF PROPOSED REGULATIONS

Source category	Source type		
	New	Modified	Total
Fossil fuel-fired steam generator[a] (>250x10^6 Btu/h)	1		1
Coal-cleaning plant[a]	18		18
Portland cement plant[a]	1		1
Primary zinc smelter[a]			
Iron and steel mill plant[a]	6	1	7
Primary bauxite smelter			
Primary copper smelter[a]			
Municipal incinerator[a]	1		1
Hydrofluoric acid plant			
Sulfuric acid plant[a]			
Nitric acid plant[a]			
Lime plant[a]	7		7
Petroleum refinery[a]	4	3	7
Coke oven battery	2		2
Phosphate rock processing plant			
Sulfur recovery plant	2		2
Carbon black plant			
Primary lead smelter[a]			
Secondary metal production plant	10	2	12
Chemical process	8		8
Industrial boiler[a] (>250x10^6 Btu/h)	8	1	9
Petroleum storage and transfer units[a]	8	2	10
Taconite ore processing plant			
Kraft pulp mill[a]			
Glass fiber processing plant	3		3
Charcoal production plant			
Fuel conversion plant	4		4
Sintering plant			
Asphalt batch plant[a]	66	8	74
Rock crushing	9		9
Natural gas compressor			
Mining	14	4	18
Turbine	2		2
Other	84	20	104
Total	258	41	299

[a] NSPS are applicable.

to only demonstrate that it would meet the applicable NSPS, NESHAPS or SIP limit. Of the 299 new or modified sources not subject to the proposed regulations, approximately 203(68%) have controlled emissions less than 50 tons per year; thus these sources were not required to apply BACT or to go to the additional expense of installing control more stringent than that required by NSPS or SIP. Many of these sources, however, may have applied controls beyond those required by NSPS or SIP (but not equal to BACT), which resulted in emissions of less than 50 tons per year, and thus they were exempt from the BACT requirements. Therefore, an attempt was made to calculate the cost savings accrued by sources who would no longer have an incentive under the proposed regulations to reduce their emissions below 50 tons per year.

Comparisons of emissions reported in the PSD permits with those allowed by an applicable NSPS or SIP limit indicated that more emissions would be emitted by some sources not be subject to PSD. (NESHAP limits were not included in the analysis since very little information was contained in the PSD permits with respect to the pollutants covered by NESHAPS.) In many cases the emissions from meeting the NSPS or SIP limit, however, would be less than 50 tons per year. Table 7 lists the particulate emissions that could be emitted under the SIP or BACT based on the permits which were issued from April 1, 1978 to November 1, 1979.

A closer review of the permit data indicated that although more emissions would be allowed, the difference in control levels to obtain these emissions would not exceed 2 or 3 percent. For example, instead of a requirement to install a 99 percent efficient fabric filter, a source would be required to install only a 97 percent efficient one; this difference in efficiency would only have a slight variation in cost because the parameters that affect costs (A/C ratio, number of bags, type of cleaning, etc.) are determined more by source application than by the desire to obtain a particular control efficiency. Although savings associated with the sizing of fans or other air-moving equipment might be realized, these savings in comparison to the overall control equipment cost would be relatively insignificant--thousands compared to tens or hundreds of thousands of dollars. Thus, although cost savings are possible for sources with emissions less than 50 tons per year, most sources would not incur any savings in control cost by not being subject to the proposed regulations. It should be noted that for those sources which emit VOC emissions there could be some control cost savings as a result of not being subject to PSD review because in many cases, there are only a few NSPS and SIP requirements that affect VOC sources, especially those that would emit less than 50 tons per year.

3.5.2 Emissions More Than 50 Tons Per Year

Of the 96 sources not subject to the proposed regulations with controlled emissions greater than 50 tons per year, 65

TABLE 7. COMPARISON OF PARTICULATE MATTER EMISSIONS UNDER BACT AND SIP FOR SOURCES THAT WOULD NO LONGER BE SUBJECT TO PSD REVIEW

Source category	Emissions, tons/yr	
	BACT	SIP
Secondary aluminum	9	65
Steel foundry	0	47
Fiberglass	49	171
Mineral wool	20	93
Steel foundry	28	49
Fiberglass	11	14
Polyvinylchloride (PVC)	6	43
Woodworking	7	47
Woodworking	7	12
Rice mill	26	49
Asphalt plant	1	3
Cement plant	49	142
Iron borings	15	49
Iron foundry	5	44
Stone-crushing	20	98
Structural steel	2	2
Bentonite processing	26	26

sources consisting of 9 source categories would be subject to an applicable NSPS limit. Two of these categories (petroleum refineries and iron and steel) only have an NSPS limit for specific facilities within the source, however, and not all facilities have an applicable NSPS limit.

A review of the emission limits proposed for these 65 sources under PSD indicates that in all cases the NSPS limit was equal to the BACT limit for those facilities for which an applicable NSPS limit exists. Therefore, with two exceptions (in which not all facilities were covered by NSPS) there would be no cost savings for the 65 sources because they are no longer subject to PSD review.

The remaining 31(10%) sources (those with no applicable NSPS limits and emissions between 50 and 100/250 tons per year) could relax controls to SIP levels since they would no longer be subject to PSD. Since SIP limits were available for only a few of the 31 sources (i.e. those in Table 7), a limited analysis was performed to determine the impact of the potential relaxations that may occur because the sources are no longer subject to BACT. Table 8 summarizes this analysis for selected sources. In a few cases, the SIP limit equals the BACT limit; in other cases, the SIP limit is within a factor of 2 of the BACT limit so the source could meet the limit by installing a device with an average efficiency of 5 percent less than the device currently proposed. Theoretically, a source would select a less expensive, less efficient control device, but in most cases the required control efficiency is such that the same basic control device would be needed in order to meet the relaxed limit. If this is the case, there would be little if any cost savings. If these sources could meet the SIP limits without any control, the overall cost savings, based on the cost data in the PSD permits surveyed, would be on the order of $25 million for the period covered by the survey. This would amount to an average control cost savings of approximately $850,000 per source. Because some basic level of control would be needed under the SIP, however, the overall cost savings would more likely be on the order of $3 to 6 million for the period covered by the survey. ($1.9 to $3.7 million on a yearly basis.) This would amount to an average savings of $100,000 to $200,000 per source. Since the SIP limit is not significantly different from the BACT limit for a number of sources, $100,000 to $200,000 per source is a reasonable estimate of the possible savings associated with a source having to meet a less stringent emission limit as a result of not being subject to PSD. The above costs savings are in terms of capital cost since no data were available regarding the operation and maintenance costs for the sources included in the survey.

Although certain sources that are currently subject to PSD review will no longer be subject, other sources that previously

TABLE 8. SELECTED EXAMPLES OF BACT/NSPS LIMITS AND ASSOCIATED COSTS TO MEET THESE LIMITS

Category	Size	Control[c]	BACT	Cost, dollars	NSPS	Cost, dollars	SIP	Cost, dollars	Pollutant
Asphalt	300 tons/h	FF 99.9%	0.03 gr/scf	100 x 10^3	0.03 gr/scf	100 x 10^3	0.03 gr/scf	100 x 10^3	PM
Formaldehyde[a]	135 x 10^6 lb/yr	Catalytic afterburner 95.0%	10.1 lb/h	290 x 10^3			14.1 lb/h	290 x 10^3	VOC
Lime[a]	130 tons/h	FF 99.7%	2.1 lb/h	107 x 10^3	9 lb/h		29.6 lb/h	100 x 10^3	PM
Foundry	39 tons/h	FF 99.0%	1.6 lb/h	2.8 x 10^6			18.3 lb/h	(89%)	
Furniture manufacturer		FF 99.9%	1.2 lb/h	225 x 10^3			1.80 lb/h	225 x 10^3	
Secondary aluminum	3750 lb/h	FF	5.3 lb/h	200 x 10^3			5.30 lb/h	200 x 10^3	
Steel fabrication	750 tons/yr	FF 99.0%	0.4 lb/h	40 x 10^3			0.4 lb/h	40 x 10^3	
Industrial boiler[a]	352 x 10^6 Btu/h	FF 99.0%	0.1 lb/10^6	300 x 10^3	0.1 lb/10^6 Btu				
Secondary metal.		FF 98.0%	9.6 lb/h	709 x 10^3			19.2 lb/h	(96%)[b]	
Fiberglass		Venturi & wet ESP-80%	33.3 lb/h	2.5 x 10^6			45.0 ob/h	(73%)[b]	
Clay prod.	18195 lb/h	FF 99.8%	16.5 lb/h	50 x 10^3			45.0 lb/h	50 x 10^3	
Coal preparation[a]	300 tons/h	Wet suppression	0.03 gr/scf	10 x 10^3			0.03 gr/scf	10 x 10^3	

[a] NSPS limits are applicable.

[b] Costs were not able to be calculated because not enough data were available regarding control equipment design parameters. Numbers in parenthesis represent the control efficiency needed to meet the applicable limit.

[c] FF is a fabric filter, ESP is an electrostatic precipitator, Venturi is a venturi scrubber.

NOTE: Cost data obtained from PSD permit files included in the survey of permits from April 1, 1978 to November 1, 1979.

were not subject will be subject as a result of the proposed regulations. These sources are those modifications to major sources that would have increased controlled emissions in excess of the *de minimis* levels, but uncontrolled emissions less than 100/250 tons per year. Since most of the modifications would have emissions on the order of 10 to 50 tons per year and would be subject to at least SIP limits if not NSPS limits, the additional control technology costs of meeting BACT (since BACT is equal to NSPS or the SIP in many cases) results in no additional control costs being incurred. There will be cases, however, in which the BACT limit would require that additional controls be imposed. If the above estimates regarding the control cost differential between BACT and SIP are used and approximately 10 percent of the modifications (120 sources per year--see Section 4.3 for details on number of modifications to be subject) that would come under review would require that additional controls be imposed, the additional cost would be on the order of $12 to 24 million/yr (120 sources x $100,000--120 sources x $200,000).

Therefore the net impact in terms of additional control costs of revising the regulations would be on the order of $10 to 20 million dollars ($12 minus $1.9 million to $24 minus $3.7 million).

3.6 COSTS FOR AIR QUALITY ASSESSMENTS

Under the proposed regulations, all major new and modified sources with net emissions in excess of the *de minimis* levels must assess the source's impact on the air quality increments and the NAAQS's through modeling and preconstruction monitoring. The current regulations only require that an ambient air quality impact assessment be conducted for new and modified sources that would emit levels in excess of 50 tons per year. Therefore, an assessment was undertaken to compare the cost associated with the proposed versus the current regulations, regarding the modeling and monitoring efforts needed to comply with the respective regulations.

3.6.1 Estimates for Preconstruction Modeling

The modeling efforts were divided into five example categories ranging in complexity from the initial screening to sophisticated modeling with three or four iterations. These example categories were developed as a result of PEDCo's previous experiences with modeling and the associated cost. Table 9 lists the five basic categories and their estimated costs.

The level of complexity is a function of meteorological and geographical considerations, source configurations, and number and location of receptors. This review considered PTMAX, PTDIS, and PTMTP as the less sophisticated models and CRSTR, RAM, CDM, and VALLEY as the more sophisticated models.

TABLE 9. MODELING COSTS FOR PSD REVIEW

	Cost	Description
I.	$ 500	Initial screening - calculation of ground-level maximum concentration using basic Gaussian dispersion equations[a]
II.	$ 1,500	Screening models - nonsophisticated models PTMAX, PTDIS, PTMTP; limited receptor sites and meteorological considerations
III.	$15,000	Sophisticated modeling[b] - analysis of one facility in attainment area
IV.	$30,000	Sophisticated modeling[b] - analysis of one facility and one other major stationary source in attainment area for three pollutants and in nonattainment area for one pollutant; source impacts in nonattainment area
V.	$50,000	Sophisticated modeling[b] - analysis of one facility in clean pocket of nonattainment area; many other sources within impact area; three or four iterations

[a] Turner, D.B. Workbook of Atmospheric Dispersion Estimates PHS Publication No. 999-AP-26, Environmental Protection Agency, Research Triangle Park, North Carolina, 1970.

[b] Sophisticated modeling - detailed, sophisticated models such as CRSTER, RAM, and CDM.

Initial screening is defined by air quality impact values calculated by using the basic Gaussian dispersion equation. Of the approximately 471 sources for which a detailed survey was conducted, 440 had some data on the type of model used for the air quality assessment. These data were reviewed, the modeling efforts categorized according to the example categories in Table 9, and the modeling cost associated with each of the 440 permits was calculated by multiplying the number of sources within each category by the costs in Table 9. Based on these calculations the cost of modeling under the current regulations was estimated to be $6 million for the 19 month period covered by the survey ($3.9 million on a yearly basis).

The cost of modeling under the proposed regulations was calculated by using the cost information in Table 9 and multiplying by the number of sources that are subject to the proposed regulations (283) categorized by the extent of modeling that would be required based on the categories in Table 9.

For example, if five sources would be required to use sophisticated modeling in which only one facility per source would need to be analyzed (Category III), the cost of modeling would be 5 x $15,000 (cost for category III from Table 9) or $75,000 for these five sources. Similar calculations were performed for all categories and the costs summed for all 283 sources subject to the proposed regulations. The cost of modeling for these sources as a result of the proposal for the 19 month period covered by the survey was estimated to be $4.9 million ($3.0 million on a yearly basis).

3.6.2 Estimates for Preconstruction Monitoring Review

The current PSD regulations require monitoring only for pollutants for which NAAQS's exist and only for criteria pollutants emitted in excess of 50 tons per year. The proposed regulations generally require preconstruction monitoring for all pollutants regulated under the Act and emitted in excess of the proposed *de minimis* levels. Up to 1 year of preconstruction data for criteria pollutants are needed for each permit application.

The monitoring network costs[7] were calculated on an annual basis, assuming a sampling schedule of once every sixth day (i.e. 61 visits a year to each site unless otherwise specified). In reviewing the permits it was assumed that local weather data were used unless the permit specified costs incurred to establish a meteorological monitoring network; State monitoring data were used for air quality assessments under the current regulations unless the permit specified that a monitoring network was established. An average base travel cost of $600 for sample collection was included in the monitoring cost calculations. Table 10 presents an example calculation for the travel cost. It assumes an average distance of 20 miles per visit, and a mileage charge of $0.23 a mile. The labor cost to and from the network sites was calculated using a burdened wage rate of $11.50 an hour. Network estimates were based on having two monitors for TSP, NO_2, or O_3 and three for SO_2 or CO.

TABLE 10. TRAVEL COSTS FOR DATA COLLECTIONS

Vehicle operation[a] Labor cost[b]	20 x 61 = 1220 x $0.23 per mile = $281 20 x 61 =(1220 ÷ 45 mph) x $11.50 = $312
	Total $593 ≈ 600

[a] Cost = average distance (20) x number of visits per year (61) = mileage per year (1220) x charge per mile ($0.23).

[b] Cost = average distance x number of visits per year = mph (45) x charge per hour ($11.50).

The cost of monitoring under the current regulations was calculated by using the information regarding the number of monitors and type of monitoring that was conducted under the current regulations obtained from the permits file and multiplying by the costs in Table 11. The cost associated with the current regulations based on the 471 permits surveyed in detail was approximately \$0.5 million (this would amount to approximately \$0.3 million/yr). Figure 2 is an example of the calculation sheet that was used to calculate the cost of a specific type of network, consisting of two TSP and NO_2 monitors, three SO_2 and CO monitors, and monitoring for Be and Hg. Twenty-two other tables (Tables A-6 through A-28) similar to Figure 2 were developed for various combinations of pollutant monitoring and are found in Appendix A along with the specific cost data used for monitoring TSP, SO_2, CO, NO_2 and ozone (Tables A-1 through A-5). These tables were then used in calculating the cost of monitoring for a specific source for which a permit had been issued. For example, a particular cement plant in Regional Office III would have to monitor for TSP and SO_2. The table setting forth the specific requirements for TSP and SO_2 monitoring was then used to calculate the cost of monitoring for this source. In this case it was \$47,800. The cost for each source was determined and the total cost was obtained by adding the costs for all sources subject to the proposed regulations.

Less than 5 percent of the permits that have been issued to date reported that a source had established a preconstruction network to comply with the current monitoring requirements. The other 95 percent were assumed to have used previously established State or local agency monitoring networks. If 95 percent of sources required to monitor under the proposed regulations could use previously established monitoring networks, the total monitoring cost associated with the proposed regulations for the 19 month period covered by the survey would be approximately \$0.9 million dollars, or less than a 49 percent increase.

The monitoring requirements of the proposed regulations are more stringent, however, and generally require monitoring of more pollutants than the current regulations. If all sources subject to the proposed regulations included in the survey of permits established their own preconstruction networks, the additional cost would be in excess of \$12 million for the period covered by the survey (\$8.0 million/yr). It is extremely unlikely that all sources would need to establish a network for all pollutants for which monitoring is required, thus, the expected cost would be closer to \$0.9 million than to \$12 million, the latter being the outside limit of additional monitoring costs resulting from the proposed regulations.

3.6.3 Estimates for Postconstruction Monitoring

In addition to 1 year of preconstruction monitoring data, the proposed regulations may also require data from postconstruction monitoring for certain large sources. Since specific source

TABLE 11. MONITORING NETWORK COSTS

Item	Description	Cost
Instrument shelter	Portable booth, 7 x 7 ft; air conditioned; suitable for one SO_2, NO_2, or CO monitor	$ 2,300
	Unfurnished office trailer, 16 x 8 ft; larger size for more than one SO_2, NO_2 or CO monitors	3,000
Travel cost (Table 1-2)	Vehicle operation	290
	Labor cost	310
	Total	600
SO_2 monitor (Table A-1, Appendix A)	Continuous analyzer; cost amortized over 5 years; network of three monitors suggested; instrument shelter needed	13,027
CO_2 monitor (Table A-2, Appendix A)	As above	10,441[a]
NO_2 monitor (Table A-3, Appendix A)	As above, except two rather than three monitors	9,394[a]
O_3 monitor (Table A-4, Appendix A)	As above	9,386[a]
TSP monitor (Table A-5, Appendix A)	Hi-vol air sampler; 61 samples/year; two monitors per network suggested; no instrument shelter needed	1,615[a]
Pb (hi-vol)[b]	Filter preparation	3[c]
	Analytical protocol	8[c]
	61 samples per year Total	671
Be (hi-vol)[a]	Filter preparation	3[c]
	Analytical protocol	9.50[c]
	61 samples per year Total	762.50
Hg (hi-vol)[a]	Filter preparation	3[c]
	Analytical protocol	17[c]
	61 samples per year Total	$ 1,220

[a] Cost per monitor. [b] PEDCo lab estimates; hi-vol assumed in network.

[c] Cost per mile.

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations		Annualized station cost[a]		Subtotal		Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)		Total annualized costs[c] (per pollutant monitored)
TSP	2	x	$ 1615	=	$	−	(% x $ x)	=	$ 3230
NO_x	2	x	$ 9394	=	$	−	(% x $ x)	=	$ 18788
SO_2	3	x	$ 13027	=	$	−	(% x $ x)	=	$ 39 081
CO	3	x	$ 10441	=	$	−	(% x $ x)	=	$ 31323
Be		x	$ 762.50	=	$	−	(% x $ x)	=	$ 762.50
Hg		x	$ 1220.	=	$	−	(% x $ x)	=	$ 1220.0
	Subtotal								94404.50

Shelter costs

Shelter size, ft	No. of shelters		Cost per shelter		Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x	$	÷		$
~~7.0 x 7.0~~		x	$	÷		$
[✓ 16.0 x 9.0]	3	x	$ 3000	÷		$ 9000
32.0 x 8.0		x	$	÷		$
Other		x	$	÷		$
	Subtotal					9000

Travel costs

	No. of stations		Average distance, miles		No. of visits per year	= Yearly mileage		
Vehicle operation		x		x		=	x 0. /mile	= $
		x		x		=	x 0. /mile	= $
Labor cost		x		x		= (÷ mph)	x $ wage rate/h	= $
		x		x		= (÷ mph)	x $ wage rate/h	= $
	Subtotal Total annualized network cost							600*

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[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$104,004.50

Figure 2. Sample calculation sheet for annualized costs of air monitoring network.

categories were not identified in the proposal, assumptions were made about which sources would be affected by postconstruction monitoring. Assuming that the same numbers and types of sources would be issued permits during any 19-month period as in the past 19 months, 18 fossil fuel-fired steam generators, 24 refineries, and 15 chemical process plants would be required to establish and operate postconstruction monitoring networks.

Existing networks are not likely to be satisfactory for postconstruction monitoring, so additional monitoring would be required. Based on data in Table 11 the additional costs would be $3.7 million. Table 12 lists the cost estimates by source category; these estimates were based on a review of individual permits and the actual emission rates, specifically those above the *de minimis* levels were used to determine which pollutants would require monitoring.

TABLE 12. POSTCONSTRUCTION MONITORING COSTS[a]

Source category	Projected number of sources[a]	Cost, 10^6\$
Fossil fuel-fired steam generator	18	$1.2
Petroleum refinery	24	1.5
Chemical process	15	1.0
Total	57	$3.7

[a] For a 19-month time period.

3.6.4 Summary

The costs associated with the PSD requirements for modeling and monitoring are summarized in Table 13. The preconstruction estimates are given separately because of the variability of the preconstruction monitoring costs, i.e., sources could use existing data from existing networks instead of establishing their own monitoring networks. It should be noted that the estimates regarding the monitoring and modeling costs are based on the September 5 proposed *de minimis* levels and that if the levels are raised the cost of modeling and monitoring would be reduced. The exact amount is unknown since it would depend on the specific pollutant emission levels and the amount of emissions that are emitted from each individual source. Some estimates are provided in Appendix B, however, based on specific revised *de minimis* levels.

3.7 AIR QUALITY IMPACT OF SOURCES THAT WOULD NO LONGER BE SUBJECT TO PSD

Since many sources would not be subject to the proposed regulations because of the controlled emission cutoffs of 100 and 250

TABLE 13. COST IMPACT OF PSD MODELING AND MONITORING REQUIREMENTS[a]

Requirement	Current regulations	Proposed regulations	Difference between current and proposed
Modeling	$6.1	$4.9	$-1.2
Preconstruction monitoring[b]	0.5	0.9	0.4
Preconstruction monitoring[c]	0.5	12.7	12.2
Postconstruction monitoring	0	3.7	3.7

[a] For a 19-month time period.

[b] Assuming 95 percent of sources subject to proposed regulations use previously established networks.

[c] Assuming all sources subject to proposed regulations establish new networks.

tons per year, they would be exempt from preconstruction PSD review in terms of their air quality impact and the requirement to install BACT. The assumption inherent in the 100 and 250-tons-per-year controlled emission cutoffs is that the air quality impact of these sources would be for the most part of little concern in terms of review on a source by source basis.

Air quality modeling data from sources that would not be subject to the proposed regulations as a result of the change to the potential emission definition were analyzed to determine the significance of the air quality impacts. Table 14 lists the sources and their EPA region, facility size, TSP or SO_2 concentration, and percentage contribution to the respective TSP or SO_2 increment. The maximum 24-hour concentrations were estimated to occur at distances ranging from 0.25 to 3.5 km (0.15 to 2.1 mi), and the average consumed approximately 44 percent of the TSP or SO_2 increment. Although no longer subject to PSD review, if these sources are constructed after the first permit is received in an area, they would have the potential to consume significant percentages of the allowable TSP or SO_2 increment near the source (e.g., 0.2 to 1 km); the extent of consumption would be directly dependent on the area of impact associated with the source.

Air quality impacts associated with sources no longer subject to PSD regulations may be higher than those in Table 14, since these impacts were calculated assuming that the source had applied BACT. Because these sources are no longer subject to PSD review, the levels of emissions permitted could be substantially greater than those used in the air quality impact analysis if the SIP or NSPS limits would be significantly less stringent than BACT.

TABLE 14. MODELING RESULTS OF PROPOSED NEW SOURCES NOT SUBJECT TO PROPOSED PSD REGULATIONS

Source category	Capacity or facility size[a]	Emission, tons/yr		24-h avg conc, μg/m^3		Consumption of increment %
		PM	SO$_2$	TSP	SO$_2$	
Lime plant	150x10^3	805		5		14
Liquid waste incinerator	9,499	6		37		100
Municipal incinerator	31,200	22		13		35
Clay processing		180		26		69
Opalite plant	270x10^3	32		5		14
Plywood manufacturing	210x10^6 Btu/h	116		29		77
Refinery	200 bbl/day	3		<1		1
Coal gasification	20x10^6 Btu/h		150		23	25
Coal preparation	2.3x10^6	17		26		69
Woodworking	45x10^3 BD ft/wk[c]	47		11		30
Gold and silver mining	1,000 tons/h	699		37		100
Molybdenum mine	7.9x10^6	600		32		86
Rock quarry	250x10^3	44		31		84
Aluminum reclamation	21x10^3	96		<1[b]		2
Casting facility		43		<1		1
Industrial boiler	352x10^6 Btu/h	33		6		15
Silica fusion	3,600	3		6		16
Sulfur recovery		82		<1		1
Glass fiber product	31,025	72		9		24
Asphalt	128 tons/h	17		17		45
Asphalt	256 tons/h	6		18		47

[a] Tons/yr unless otherwise specified.

[b] Annual average concentration.

[c] Board feet/week.

REFERENCES FOR SECTION 3

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3. Personal communication with C. Marshall, Regional Air Pollution Control District, Dayton, Ohio, June 30, 1979.

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6. Personal communication with C.W. Van, Kepple Co., Kansas City, Missouri. January 25, 1980.

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SECTION 4

MAJOR ISSUES ASSOCIATED WITH THE PROPOSED REGULATIONS

A number of issues have been raised regarding the proposed regulations:

1. Preconstruction notice
2. Applicability of fugitive emissions
3. Definitions of source, facility, installation, and modification
4. *De minimis* levels
5. Area for baseline determination
6. Monitoring requirements (Section 3.6)
7. Geographic applicability (Section 5.0)
8. Pollutant applicability
9. Innovative technology waiver
10. Secondary emissions
11. Portable facilities
12. Nonprofit institutions.

Assessments of the impacts of the first five issues are in Sections 4.1 to 4.5, respectively. The sixth issue was previously discussed in Section 3.6, and the seventh issue will be discussed in Section 5.0. The remaining issues are discussed in Section 4.6.

4.1 PRECONSTRUCTION NOTICE REQUIREMENTS

The proposed amendments to the current regulations require a preconstruction notice from all new and modified sources subject to, and from selected new and modified sources not subject to, the proposed regulations. If the source is subject, the notice is only a written statement with the date that construction will begin. This must be submitted at least 90 days before that date. If the source is not subject, a notice is required for (1) a modification to a major source that would have been subject if it had not had sufficient reductions in contemporaneous emissions, (2) a new source that would have been classified as major if it had not applied control equipment more efficient than that generally required by the applicable SIP or other specified standard, and (3) reductions that will be used for future offsets. The following sections outline the requirements, their estimated costs, and the projected impacts of the preconstruction notice requirement.

4.1.1 Contents of the Notice

As specified in the proposed regulations the information required in a preconstruction notice differs slightly between new and modified sources. For both, the following information is required:

1. Name and address of owner/operator.
2. Nature of source or modification.
3. Location of source or modification.
4. Potential (controlled) and allowable emission rates for any pollutant regulated under the Act for all units within the new or modified source.
5. A schedule of when changes in the emissions of any regulated pollutant are expected to occur.
6. Any other information deemed necessary by the EPA Administrator to determine whether a source is exempt from impact assessment and PSD review.

A modified source using contemporaneous emission reductions for offsets must include:

7. Calculations of how the contemporaneous emission reductions identified in a separate notification would adequately offset any emission increases of any regulated pollutant.
8. A demonstration that each emission reduction would be enforceable under the SIP.

The separate notification mentioned in Item 7 is required at the time any emission reduction would be used for offset; this notification should include:

1. Name and address of the owner/operator.
2. Type and amount of each emission decrease, and identification of the affected emission unit.
3. Schedule of when each contemporaneous emission reduction has or is expected to occur.
4. Other information deemed necessary by the EPA Administrator to determine if the reductions are acceptable.

Under Item 6, EPA may request additional data for evaluation of the notice; as a minimum, EPA is expected to request data on process rate, annual operating hours, fuel analysis, and control equipment design parameters.

4.1.2 Costs of Preparation

Preparation of a preconstruction notice will require time and effort by the owner/operator or an agent. The level of effort is expected to vary with the complexity of the proposed construction activity. Effort/cost estimates were based on source categories and on whether the construction activity was classified as a new or modified source. Following are discussions of each item listed above and estimates of man-hours required to satisfy the information requirements and the preparation of the submittal.

1. Reporting the name and address of the owner/operator requires negligible cost.

2. Describing the proposed activity briefly or in detail (depending on EPA guidelines should include the type of process, raw materials input, products, operating hours, maximum and design capacity, fuels used, and emission points identified); such data should be readily available as part of the design and engineering of the construction activity. The time required to assemble the data can vary greatly with the number of emission units within the source/modification. The estimated hours needed for preparation of these data range from 20 man-hours for simple sources to 120 man-hours for complex sources/modifications.

3. Specifying the location of source/modification will require determining the universal transverse mercator (UTM) coordinates and specifying the city, county, AQCR, and the site address. This is estimated to require 8 to 16 man-hours.

4. Calculating potential and allowable emission rates can be complex and time consuming for sources with many emission units emitting several regulated pollutants. If emission factors are not readily available, an engineering analysis should include material balances and extrapolation of data from other similar sources. For a straightforward source with few emission points and few regulated pollutants, the effort is estimated at 8 man-hours; for a complex source/modification with several emission units and without emission rate data, the estimate is 100 man-hours.

5. The development of a time schedule when changes in emissions of any pollutant will occur is estimated to require 4 man-hours.

6. Supplying other EPA required data on the types of control equipment and the number of emission units on which control is applied (at a minimum, control equipment design parameters) may be simplified by using the specifications of the owner of the facility or the vendor of the control equipment. This effort should only require assembling the necessary data and preparing a submittal to EPA. For an ESP on a small boiler, the effort is estimated as 8 man-hours; for a large power plant with ESP's and limestone scrubbing, the estimate is 40 to 100 man-hours, depending on the number of control devices.

7. Calculating the proposed contemporaneous emission reductions for offsets is an effort similar to that for estimating emissions from proposed modifications; for existing processes, emission calculations may be available for submittal with little revision or recalculation. If not, the effort required to prepare offset calculations for submittal may be up to 100 man-hours.

8. Demonstrating that each contemporaneous emission reduction would be enforceable under an SIP would vary greatly with the situation. If the reduction was to be achieved by shutting down an emission unit, the demonstration would consist of a rescission of the State operating permit; a rescission is estimated at 40 man-hours. If the operating hours of an emission unit are to be limited, the operating permit must be revised to incorporate the limit; this is estimated to require about 60 man-hours. If the reduction on a unit is to be achieved by installing more efficient control equipment or by a process change, a revised operating permit must be obtained specifying lower emission limits; this is the most complex and time-consuming situation since it would be equivalent to obtaining a new permit subject to complete review it is estimated at 100 to 300 man-hours.

9. Submitting a separate notification, when a modified source proposed to use contemporaneous emission reductions as offsets, requires no information in addition to that already obtained to fulfill the preconstruction notice requirements; the effort required to prepare and submit

> the separate notice will vary with the number of notices (one for each emission unit retirement date), but little effort will be required for subsequent notices after the first one has been submitted. The effort is estimated as 20 man-hours.

Table 15 presents estimated costs for Items 1 through 8. The costs for new and modified sources are based on a burdened rate of $35 per man-hour. The cost ranges from $2800 for a simple new source to $26,600 for a complex modification.

4.1.3 Future Effects

The purpose of the preconstruction notice is to provide EPA with data on construction activities that were borderline (as far as not being subject) and for which EPA had no other source of data. Thus, the preconstruction notice requirements would affect only borderline sources deemed by the owners/operators as not subject. Since it is difficult to quantify the number of future borderline sources, the assessment of the impact of the preconstruction notice requirement was conducted in terms of the general effects that the proposed regulations would have with regard to specific preconstruction notice requirements. To illustrate the effects of the preconstruction notice requirements, existing PSD permits were reviewed to identify sources that would be subject to the notice requirements, each source emitting just above the cutoff being classified as "possibles." The limits assumed for classifying as possible were 100 to 150 tons per year for the 28 source categories and 250 to 300 tons per year for other source categories. Each source classified as possible was further identified as either new or modified and as simple or complex, as shown in Table 15. Then the costs were calculated for fulfilling the preconstruction notice requirements. Table 16 summarizes the characteristics of the sources and the estimated costs of the preconstruction notices. The total estimated cost based on the information available is approximately $171,500 for the 19-month period covered by the survey ($0.1 million on an annual basis). This cost estimate is only indicative of the types of situations in which the preconstruction notice would clearly have an effect.

4.2 FUGITIVE EMISSIONS

Under current regulations, fugitive emissions were to have been included in determining source applicability, but not all sources within the source categories that have fugitive emissions provided estimates of these on the PSD application. The fugitive emissions may have been included in the stack or process emission estimates; the sources may have ignored the fugitive emissions; or in some cases confusion over what constitutes fugitive emissions may have contributed to the lack of reporting.

TABLE 15. ESTIMATED COSTS FOR PREPARING AND SUBMITTING A PRECONSTRUCTION NOTICE

Source classification	Facility description	Location	Emission calculation	Costs/item submitted			SIP demon	Reduction notice	Total
				Scheduled change	Other data	Emission reduction calculation			
New source									
Simple	$ 700	$280	$ 280	$140	$1,400				$ 2,800
Complex	4,200	560	3,500	140	3,500				11,900
Modification									
Simple	700	280	280	140	1,400	350	1,400	700	5,250
Complex	$4,200	$560	$3,500	$140	$3,500	$3,500	$10,500	$700	$26,600

TABLE 16. ESTIMATED COSTS FOR SOURCES HYPOTHETICALLY AFFECTED BY PROPOSED PRECONSTRUCTION NOTICE REQUIREMENTS

U.S. EPA region	Source category	Capacity	Emissions, tons/yr			Source classification[a]	Estimated cost[a]
			Major pollutant	Allowable	Offsets		
III	Electric arc furnaces-2		600.0 CO		600.0 CO	M-C	$26,600
IV	Storage tanks	1,726,600 bbl	85.0 HC	222.0 HC		N-S	2,800
IV	Coal preparation	624,000 tons/yr	15.6 PM	176.5 PM		N-C	11,900
V	Electric arc furnace	250,000 tons/yr	1.2 PM	132.0 PM		N-C	11,900
V	Fiberglass insulation	31,000 tons/yr	72.3 PM	145.8 PM		N-C	11,900
V	Printing process	1,427 lb ink/h	72.3 HC	536.0 HC	72.3 HC	M-S	5,250
V	Mineral fiber process	11,324 lb/h	91.9 CO 27.0 SO_2 13.8 PM	826.0 CO 258.0 SO_2 532.0 PM		N-C	11,900
							$82,250
Sources likely to be subject to requirements							
III	Coal-fired boiler	147.8x10^6 Btu/h	299.9 SO_2			N-C	11,900
III	AFB coal-fired boiler	98.3x10^6 Btu/h	301.0 SO_2			N-C	11,900
III	SNG plant	60x10^6 scfd	135.0 SO_2 133.0 NO_x			N-C	11,900
III	Thermal dryer	287 tons/h	120.0 SO_2			N-C	11,900
IV	Fertilizer plant		122.0 PM			N-C	11,900
IV	Oil-fired gas turbine	252 MW	284.0 SO_2			N-S	2,800
VI	Petroleum refinery	10,000 bbl/day	119.0 SO_2			N-C	11,900
IX	Storage tanks	615,000 bbl	125.0 HC			N-S	2,800
IX	Petroleum recovery	285.0 NO_x				N-C	11,900
							88,900
							$171,150[b]

[a] M is modification, N is new source, C is complex, S is simple (See Table 15).

[b] For a 19-month time period.

4.2.1 Sources on List of 28

Data from PSD permit and application forms filed in EPA Regional Offices III through X were reviewed to identify source categories on EPA's list of 28 (the list would be 26 if sulfuric, nitric, and HF acid plants are considered to be one category), which would be subject to proposed regulations by including fugitive emissions in the cutoff of 100 tons per year.

Based on the limited data available coke oven batteries is the only source category on the list of 28 published in the proposed regulations (see Section 2 for enumeration of this list) that would be subject to the proposed regulations as a result of fugitive emissions being included in calculating the potential to emit. Interpretation of the data was difficult because of inconsistencies in emission classifications. Of the four coke oven batteries in the data sample, a single figure for total particulate emissions was reported for one, but no fugitive emissions were listed for another. At another battery, coal handling was classified as a fugitive emission source, but charging, pushing, and coking were classified as process emission sources; at two other batteries, charging, pushing, and coking were classified as fugitive emission sources. Thus for the assessment, the emissions from each coke oven were recalculated or redistributed according to the definition of fugitive emissions in the proposed regulations. Coal handling, coking, pushing, quenching, and charging were considered fugitive sources regardless of how they were classified on the PSD permit and application forms. Accordingly, all four coke oven batteries would be subject to the proposed regulations if fugitive emissions were considered in determining applicability. If fugitive emissions were not considered, these sources would not be subject to the proposed regulations.

Sources such as Portland cement plants and coal-cleaning facilities produce emissions in quantities greater than 100 tons per year that could be considered "fugitive" emissions under the proposed definition; however, these emissions were listed as process emissions in the current PSD applications for these sources. Since these sources are on the list of 28 source categories published in the proposal, fugitive emissions are to be included in the calculation of potential emissions. Therefore, no matter how these emissions might be defined, based on the proposal the source would be subject to PSD review. If the proposal would be changed, however, so that fugitive emissions would not be included in the calculation of potential emissions for these sources and some of the current emissions defined as process emissions are redefined as fugitive emissions, there could be situations in which these sources would no longer be subject to PSD review. This would not be the situation in all cases as some of these sources may have facilities such as kilns or thermal dryers that would have stack emissions in excess of 100 ton per year, and therefore the source would still be subject to review.

Additionally there are other sources such as coal-fired power plants that emit fugitive particulate matter in quantities greater than 100 tons per year, but they also emit equal or greater quantities of process or combustion emissions, and thus would be subject to the proposed regulations whether or not fugitive emissions were considered.

Many modifications not subject to current PSD regulations would be subject to the proposed regulations because of the *de minimis* levels. A modified source may not increase its stack emissions by the *de minimis* amounts, but its fugitive emissions could be in excess of the *de minimis* levels and could cause an otherwise minor modification to be subject to the proposed regulations. For example, the addition of a storage pile handling 41 tons per day of material to an existing source could emit over 10 tons per year of fugitive particulate matter emissions. New well-controlled pumps handling 5500 barrels per day could cause fugitive hydrocarbon emissions in excess of 10 tons per day.

4.2.2 Sources Not on the List of 28

Two sources in the group of permits reviewed--a limestone-crushing facility and a gold/silver mine are not subject to the proposed regulations, but would be subject if fugitive emissions were considered in the cutoff of 250 tons per year.

In the case of a limestone-crushing facility, fugitive emissions from storage piles are reported as 750 tons per year and would be the basis for subjecting this source to PSD review if included for the purpose of source applicability.

In the case of a gold/silver mine, the particulate emissions from the tailings pond were reported as 635 tons per year of fugitive dust; for this assessment, these emissions were considered fugitive emissions because they are a waste product of processing and they represent a material that had been altered by operation of the source.

If the considerable quantities of fugitive dust emissions from surface mines are included for the purposes of determining applicability for this source category, then all of the mining operations (which have received permits) would be subject to the proposed regulations.

4.2.3 Air Quality Impact of Fugitive Emissions for Selected Sources

Because it is believed that the inclusion of fugitive emission for certain sources may have a significant air quality impact especially for those emissions that are associated with mining operations, a special assessment[1] was conducted outside this effort to determine the air quality impact of fugitive emissions from mining activities for contiguous (mine-mouth) processing facilities once a source is subject to review. The following types of facilities were examined:

Coal-fired power generation
Coal preparation
Indirect coal liquefaction
Direct coal liquefaction
Coal gasification
Oil shale processing
Uranium milling

Since many of the above facilities will be located adjacent to the mine site, the mining operation would be part of the source and the fugitive emissions from this mining operation would be considered in any review of these facilities once the source is subject to PSD. It should be pointed out, however, that if these mining operations were located by themselves or were located adjacent to sources not on the list of sources for which fugitive emissions are to be considered in terms of applicability, their fugitive emissions would not be considered in determining applicability and unless the mine had stack emissions greater than 250 tons per year (i.e. subject to PSD), the fugitive emissions associated with the mining operations would not be considered in terms of their air quality impact.

This assessment was conducted by developing model plants and mines for each of the facilities listed above. Each model plant was assumed to have applied BACT. Emission rates and stack parameters were developed for each model plant, and the ambient air quality impact was determined using the Industrial Source Complex (ISC) model. The ambient impact of the plant was calculated and compared with the Class I and II increments. The associated mining operations were added to the plant emissions and both were modeled. These revised predicted particulate concentrations were also compared with the Class I and II increments.

The results of the modeling analysis for the emissions from the processing facilities alone are rather straightforward. None of the seven types of facilities would have any problems with the Class II particulate matter increment. The maximum TSP concentrations ranged from 0.08 $\mu g/m^3$ to 10.2 $\mu g/m^3$. Only one facility, uranium milling, might exceed the Class I increment. However, if the mining fugitive emissions are included, substantial violations of both the Class I and Class II increment are predicted to occur. The major source of fugitive emissions are the haul roads that can account for up to 99 percent of the fugitive emissions depending on the model plant. Table 17 presents a summary of the results of this analysis. It should be noted however, that the estimates of the fugitive emissions from mining operations are somewhat limited and have been questioned as to their representativeness. In addition since this analysis used the model plant concept, the

TABLE 17. MAXIMUM ANNUAL AVERAGE TSP CONCENTRATIONS AT MODEL PLANTS

Plant type	Highest concentrations, $\mu g/m^3$		
	Plant	Plant and mine w/o haul roads	Plant and mine
Oil shale	6.9	25.9	184.4
Coal gasification	0.2	28.5	64.2
Coal liquefaction (direct)	0.6	31.0	58.9
Coal liquefaction (indirect)	3.9	33.4	63.2
Uranium milling	10.2	44.2	62.8
Coal-fired power generation	0.1	16.3	39.6
Coal preparation	0.2	16.2	34.2

specific configuration of an individual source will have an impact upon the results especially since the maximum concentrations associated with these sources were estimated to occur anywhere from 0.5 to 1.5 km.

4.2.4 Summary

Many sources such as iron and steel mills, crushing or grinding operations, petroleum refineries, and chemical process emissions may not be considering fugitive emissions in their estimates of total emissions because of confusion over fugitive versus process emissions. Many petroleum and chemical process sources apparently included fugitive emissions in the process emissions estimates (based on the relative amount of total emissions estimated); most of the sources reported process or stack emissions that were of such a magnitude that the sources would be subject regardless of fugitive emissions.

Although including or excluding fugitive emissions does not appear to have a major impact on new sources (based on the available permit data), it may have an impact on major modifications not subject to current regulations and not included in the data base. Although not really increasing their stack emissions, existing sources could modify their facility so that minor fugitive emissions are emitted (e.g., the replacement or addition of valves or pumps, or the addition of a new storage pile or materials-handling operation) that would be above the *de minimis* levels and therefore the source could be subject to PSD review. No data are currently available that would indicate the magnitude of this impact. However, it could be substantial since these minor modifications could emit fugitive emissions above the *de minimis* levels.

Very little, if any, information regarding fugitive emissions was contained in the PSD permit files. In most cases sources did not provide any special mention of fugitive emissions except in those cases involving fugitive dust emissions. Because of this lack of information on fugitive emissions, very little in the way of a quantitative assessment could be undertaken.

Finally based on the assessment of the seven model plants that may have mining fugitive emissions associated with their operation, the proposed regulations (which provide that fugitive emissions associated with activities occurring at any of the 28 sources categories listed in the proposal be included in any PSD review) could prevent the construction of new mine-mouth processing facilities even with the application of BACT on the fugitive emission sources.

4.3 DEFINITIONS OF SOURCE, FACILITY, INSTALLATION, AND MODIFICATION

In the proposed regulations, the definitions of source, facility, installation, and modification differ from the definitions in the current regulations. The following sections explain the differences and assess the effects and implications of these differences.

4.3.1 Differences in Definitions

In the current regulations, source, facility, installation, and modification are defined as follows:

> Source - any structure, building, facility, equipment, installation, or operation (or combination thereof) . . . on one or more contiguous or adjacent properties . . . owned or operated by the same person (or by persons under common control).
>
> Facility - an identifiable piece of process equipment.
>
> Installation - not specifically defined, but included in the definition of "source."
>
> Modification - any physical change . . . in the . . . operation of, or any addition to a source which increases the potential emission rate of any air pollutant regulated under the Act (including any not previously emitted and taking into account all accumulated increases in potential emissions occurring at the source since August 7, 1977, or since the time of the last construction approval issued for the source pursuant to this section, whichever time is more recent, regardless of any emission reductions achieved elsewhere in the source) by either 100 tons per year or more for any source category identified on the list of 28 or by 250 tons per year or more for any other source.

As stated, a source is one or more pollutant-emitting facilities (or installations) on the same property.

In the proposed regulations, source, facility, installation, and modification are defined as follows:

> Source - any structure, building, facility, or installation which emits or may emit any air pollutant governed under the Act.
>
> Facility - any grouping of pollutant-emitting activities . . . on one or more contiguous or adjacent properties . . . owned or operated by the same person (or persons under common control).
>
> Installation - any grouping of pollutant-emitting activities . . . on one or more contiguous or adjacent properties . . . are owned or operated by the same person (or persons under common control).

> Modification - any physical change . . . in the . . . operation of . . . or series of contemporaneous physical changes in . . . operation of a major stationary source that would result in a significant net increase in . . . potential to emit the pollutant for which the . . . source is major (or that would make the . . . source major, taking into account all accumulated net increases in potential emissions occurring at the source including any initial construction since August 7, 1977).

As stated, source, facility, and installation are equivalent terms describing a group of pollutant-emitting activities on the same property. In the current regulations, a facility is a piece of process equipment, and a source is one or more facilities; in the proposed regulations, a facility is equivalent to a source, and a source is one facility. The new term "emission unit" in the proposed regulations describes individual emission activities; thus a source (or facility or installation) is a group of emission units.

In the current regulations, a modification is a change in any source that produces an increase in emission potential above the cutoff of 100 or 250 tons per year; no consideration is given to emission reductions within the source, but accumulated increases from August 7, 1977, are considered. In the proposed regulations, a modification is a change in a major source (or a change that would make the source major) that produces a significant net increase in the potential to emit the major pollutant; (i.e. greater than the *de minimis* levels) net increase indicates the allowance of credit for contemporaneous emission reductions.

The proposed regulations would cover most changes that would have been considered modifications under the current regulations, but would exclude sources with insignificant increases, no increases, or a net decrease in emissions of the major pollutant because of emission reductions elsewhere within the source. The proposal would only include changes in a major source that result in a significant increase (i.e., greater than *de minimis*) in emissions of the major pollutant. To illustrate the applicability of modification under the current and proposed regulations, the following three cases are presented.

> First case - A change in a minor source results in an uncontrolled emission potential for a regulated pollutant of more than 100 or 250 tons per year (depending on the source category), but the controlled emission potential is less than the cutoff of 100 or 250 tons per year. Under current regulations, this modification is subject to review; under the proposed regulations it is not because of the change in the

definition of "potential to emit" from an uncontrolled to a controlled basis (more details can be found in Section 3).

Second case - A modification to a major source results in an increase of less than 100 to 250 tons per year in the uncontrolled emissions of the major pollutant; the controlled emissions of the major pollutant are above the *de minimis* level, and there are no reductions in emissions elsewhere in the source. Under current regulations the modification is not subject to review, but it is subject under the proposed regulations because of a significant emission increase in the major pollutant above the proposed *de minimis* levels (more details on impact of *de minimis* can be found in Section 4.4).

Third case - A modification to a major source results in an increase of more than 100 to 250 tons per year in the uncontrolled emissions of the major pollutant; the controlled emissions of the major pollutant are offset by a reduction elsewhere in the source to produce a net decrease. Under current regulations the modification would be subject, but it would not be subject under the proposed regulations because of the credit for emission reductions.

4.3.2 Effects of the Definitions

Under the current regulations, a source is a single building, structure, facility, installation, or a combination thereof. The court (in Alabama Power) stated that a source (already defined in Section 111(a)) does not include a "combination thereof;" therefore, EPA eliminated "combination thereof" from the proposed regulations.

The court indicated that EPA could define the components of a source to best carry out the statutory intent of the PSD provisions. The proposal indicates that the appropriate grouping is all emitting activities on contiguous or adjacent property under common control; in other words, the source should be an industrial plant.

4.3.2.1 Basing PSD Applicability on One Facility--

The effect of not defining structure, building, facility, or installation as any grouping of pollutant-emitting activities was assessed by comparing sources subject to the proposed regulations with sources subject to review based on the capability of an individual unit to emit emissions in excess of the major source cutoffs or in excess of the proposed *de minimis* levels if a modification. Of the 114 new and 118 modified sources subject to PSD review under the proposed regulations, approximately 15 percent would have at least one facility exempt from PSD review if applicability were based on an installation or facility, and in many cases the entire plant would avoid review.

The effect of basing PSD applicability on an installation or facility is somewhat tempered because many plants that have obtained permits have only one facility or installation. The impact is greater if the assessment includes only the sources that have more than one facility; on that basis, approximately 50 percent of the plants would have at least one facility exempt from PSD review, and in many cases the entire source would be exempt; thus, none of its emissions would be reviewed to assess their impacts on the increments or the NAAQS's. In four cases, the sources would have emissions when all facilities were considered that are far in excess of the cutoff of 100 or 250 tons per year. One source, which would not be subject if all installations were not considered in combination, would consume 58 percent of the 24-hour TSP increment within the vicinity of the source; therefore, a significant proportion of the increment could be consumed without review, if the proposed definitions were modified to assess PSD applicability on each facility rather than on the entire source.

4.3.2.2 Using Emission Reductions for Exemption--

Under the current regulations, only increases (not decreases) in emissions are considered in determining whether a source would be subject to PSD review; however, once a source is subject, all increases and decreases are considered in determining whether a BACT and an air quality impact review are needed. For a BACT exemption, only those decreases that would accompany the modification would be considered; for an air quality assessment exemption, all increases and decreases since August 7, 1977, would be considered. If there is no net increase after considering both the increases and the decreases, the source would not be required to conduct a case-by-case BACT review or a pollutant-specific assessment of the overall air quality impact of the source. No useful purpose would be served by requiring an impact assessment of sources that would obviously not degrade air quality.

The proposed regulations expand the use of emission decreases to exempt the source from the entire PSD review, not just the BACT and air quality impact reviews. The court (in Alabama Power) held that a change in a major source is subject to PSD review only if it results in a net increase in the source's potential to emit. The court also held that any emission increase that is offset entirely by a contemporaneous emission reduction would not be considered a modification and therefore would not be subject to review.

Only a physical change in a major source may be considered in calculating contemporaneous decreases. A narrow interpretation of "contemporaneous" would restrict emission decreases to those that would occur at the same time as the emission increases. This interpretation would seem to undercut the incentive for sources to decrease their emissions by upgrading their control equipment in advance of the modification or the increase in emissions from the source. Continuing to operate obsolete equipment with significantly higher emissions than the proposed modification makes little economic or air quality sense.

4.3.2.3 Documentation for Reduction Credits--

The proposed regulations would permit the crediting of any reduction that occurs after the promulgation date of the regulations but before the proposed increases are scheduled to occur. Credit may be retained if the source files a notice (within 90 days after promulgation) reporting the shutdown or curtailments that occurred before promulgation. A followup notice would be required to document the construction schedule for the proposed modification and emissions increase.

Since current regulations permit only reductions that occur at the time of the proposed modification, it is difficult to assess the overall impact of the proposed changes regarding the crediting of reductions for avoiding PSD review. Because only the decreases that occurred with the increase were reported in the current PSD files, there are no data on how many and what type of decreases had occurred and could be reported by a source after promulgation to offset future increases.

4.3.2.4 Impact of Netting Under PSD--

Assessment of the total number of modifications that would be exempt from review as a result of the netting exemption was not possible based on the data in the PSD permit files, but a limited analysis was undertaken using data on simultaneous emission reductions that were used by sources to avoid BACT review under the current regulations. Five example modifications were selected: two separate industrial boilers, an electric arc furnace, natural gas compressors, and a lime kiln. The increases and decreases associated with these sources in Table 18 are typical of those that could be used by sources under the proposed regulations.

Other types of decreases that may be used have not been identified to date. Because only simultaneous emission reductions could be used under the current regulations, the effect of the netting concept could not be completely analyzed. Based on the data from the permits issued to date, however, it does appear that this concept in and of itself in the absence of the *de minimis* concept would have a marked effect on the number of sources subject to review and on the costs associated with PSD.

4.3.2.5 Impact of Modification Definition--

Changing the current definition of modification to the proposed definition would have far-reaching effects on the applicability of the PSD regulations, as shown in Table 19. There are

TABLE 18. EXAMPLE OF MODIFICATIONS WITH ASSOCIATED EMISSION DECREASES

Source category	Type of increase	Emission increase, tons/yr	Type of decrease	Emission decrease, tons/yr	Net decrease, tons/yr
Paperboard	Two wood-waste boilers, 124×10^6 Btu/h	PM 98.8 NO_x 805.4 SO_2 45.0	Two wood-waste boilers, 124×10^6 Btu/h	PM 192.5 NO_x 1,130.5 SO_2 937.7	93.7 325.0 892.7
Chemical process	Oil-fired boiler, 81.9×10^6 Btu/h	PM 54.0 SO_2 485.0	Shut down two oil-fired boilers	PM 54.0 SO_2 559.0	74.0
Iron and steel	Two electric arc furnaces, 185 tons/h	PM 37.0[a] CO 600.0	Close down sintering operation	PM CO 10,800	10,200
Natural gas compressor	Two natural gas, 2000 HP	NO_x 637.0 CO 54.0[a]	Replace four compressors	NO_x 668.0	30.0
Kraft pulp mill	Recovery boiler and lime kiln, 800 tons/day expansion	PM 82.0	Close down two smelt tanks, and convert recovery boilers to oil	PM 38.0 PM $\underline{50.0}$ 88.0	6.0

[a] Still subject under proposed regulations; emission increase above *de minimis* levels.

TABLE 19. EFFECTS OF PROPOSED REGULATIONS ON MODIFICATIONS REVIEWED UNDER CURRENT REGULATIONS

U.S. EPA region	Number of modifications	Number with >100 or 250 tons/yr contolled	Number with <100 or 250 tons/yr	
			Above *de minimis* levels	Below *de minimis* levels
III	13	5	6	2
IV	38	15	17	6
V	10	6	3	2
VI	49	32	14	3
VII	9	4	4	1
VIII	12	4	4	4
IX	18	11	5	2
X	2	2	0	0
Total	151	79	52	20

151 modifications for which data were gathered. These modifications were obviously subject to current regulations. Of the 151, 79 had controlled emissions above the cutoff of 100 to 250 tons per year without any emission reductions elsewhere within the source; thus, these 79 would also be subject to the proposed regulations; 52 had controlled emissions below the cutoff of 100 to 250 tons per year, and had one or more pollutants for which controlled emissions exceeded the *de minimis* levels without any offsets indicated; the other 20 had no pollutant for which controlled emissions exceeded the *de minimis* levels. If all 52 were major emitters for the pollutant exceeding the *de minimis* levels, these modifications would be subject to the proposed regulations, but if some of the 52 sources were not major, then they would not be subject. Therefore, 52 is the outside estimate of the number of modifications below 100 or 250 tons per year that would be subject to review. The actual number may be somewhat less depending on the major source status of the existing source. The proposal, however, would clearly exclude the modifications (20) that resulted in emissions less than the *de minimis* levels regardless of whether the sources were major or not.

The following conclusions were drawn from the analysis of the proposed and current definitions of modification.

1. Of the modifications subject to the current regulations, 14 percent would not be subject under the proposed regulations. (If those located in nonattainment areas were included, approximately 24 percent would not be subject.)

2. Of the modifications subject to current regulations, 52 percent would be subject under the proposed regulation.

3. Of the modifications subject to the current regulations, 34 percent may or may not continue to be subject, depending on whether or not the source was major before the modification and whether the sources can offset the increases by the netting provision.

Based on the data, a higher percentage of modified than new sources would be subject under the proposed regulations, but the actual numbers of modified and new sources appear to be less than under the current regulations. However, this could be an erroneous conclusion especially for modified sources. Modified major sources that would increase emissions above the *de minimis* limits, but that would have increases less than 100 to 250 tons per year were not subject to the current regulations (and thus not in the PSD permit files). They would, however, be subject to the proposed regulations. Currently these sources are only subject to the State's NSR procedures. In fact, many States do not consider modified sources of 10 to 20 tons per year a major source of emissions; therefore, these sources are reviewed only to ensure that they meet the State's emission limits, unless there is evidence that air quality problems may exist as a result of the modification.

States do not summarize and thus do not routinely report to EPA the amount of emissions from minor sources, but these data would be in the State permit file. To determine how many sources a year would have emissions more than *de minimis* but less than 100/250 tons per year, all of the States' permit files would have to be reviewed. Since a detailed review of all State permit files could obviously not be undertaken, selected States were contacted to obtain a representative sample of the number of modifications that could be subject to PSD review under the proposed regulations. Data from Connecticut, Vermont, New York, Massachusetts,[2] Ohio,[3] North Carolina,[4] and Florida[5] on the estimated number of modifications above the *de minimis* levels and below the cutoff of 100 to 250 tons per year were categorized into four categories based on the population of the States surveyed: greater than 15 million, 5 to 15 million, 1 to 5 million, and less than 1 million people. These data, which represented the modifications that would receive permits in any 1 year, were used to roughly estimate the number of modifications that might fall into this category for the entire United States.

The estimate of the total number of modifications that are not subject to the current regulations but which would be subject to the proposed regulations were obtained by multiplying the number of permits estimated to be issued for a given population range by the number of States that had a population in that range. This amounted to approximately 5000 modifications per year (values obtained ranged from 3400 to 6600). There was no estimate, however, as to how many of these modifications of between 10 to 100 tons per year would occur at existing major sources. In order to obtain some estimate of how many modifications may occur at major existing sources, a review of the National Emissions Data System (NEDS) file was undertaken. According to the information in NEDS there were approximately 56,000 sources in the NEDS system as of January 1979. Of these 56,000 sources, approximately 12,000 were major sources (i.e., with emissions of any criteria pollutant greater than 100 tons per year). Based on the estimate that there will be 5000 modifications per year, this would mean that approximately 10 percent of the existing 56,000 stationary sources would be modified in any given year. This estimate seems realistic based on some limited data from the State of Louisana regarding the TSP and SO_2 sources that received State NSR permits for 1978 (100). If the same percentage of modifications per year for all sources in NEDS holds true for those emitting greater than 100 tons per year, then approximately 1200 of the 12,000 sources with emissions of greater than 100 tons per year would be expected to modify their source every year. Therefore, the estimates obtained from the state agencies would seem to be a reasonable representation of the total modifications per year. Thus, the number that would be expected from only those with existing emissions of greater than 100 tons per year would be approximately 1200. Based on the proposed definition, it is estimated that approximately 1200 additional modifications per year would be subject to PSD over and above those that are now currently subject to review and which would continue to be subject to review based on the proposed "*de minimis*" levels.

Because the above estimate was developed as a result of communication with state agency personnel rather than a direct review of the files, no estimate was obtained on the distribution of these modifications based on their total emissions. An estimate is made, however, in the following section on the *de minimis* emission levels that can be used to obtain an indication of the relative number of additional modifications which would be subject to PSD as a result of modifying *de minimis* levels in the September 5 proposal.

4.4 *DE MINIMIS* EMISSION LEVELS

The goals of improving and preserving air quality are best served by using the limited control agencies' resources effectively. Neither air quality improvement nor efficient administrative operations are served by requiring preconstruction reviews of sources that have no significant impact on air quality. Establishing *de minimis* cutoffs enables agencies to centralize efforts, mobilize resources, and concentrate on sources that significantly affect air quality.

The PSD requirements are generally more stringent than SIP or other limits, and thus their implementation, in lieu of other limits, tends to decrease emissions and to enhance air quality. Because the requirements are more stringent and complex, greater manpower and cost demands are imposed on both the permit applicant and the reviewing authority.

The emphasis of preconstruction review for both the permit applicant and the control agency reviewer should be on sources that significantly impact air quality. Thus, exemptions have found favor with both the regulated and the regulator as a method of eliminating the unimportant from an otherwise all-encompassing regulation.

The purpose of this analysis was to quantify the changes in source applicability that would occur as a result of applying the proposed pollutant-specific and the varying *de minimis* values in place of the single 50-ton-per-year value as the cutoff criteria for requiring a detailed review. The analysis does not address the merits and deficiencies of the *de minimis* approach as the basis for the values in the proposed regulations. The effects that alternate *de minimis* values would have on inclusion or exclusion of sources and emission units and on review requirements of the PSD program are examined.

4.4.1 Application of *De Minimis* Guidelines

Pollutant-specific guidelines for excluding or limiting the review of proposed construction can exempt major new and modified sources from PSD and nonattainment requirements when emissions are below a specified significant emission rate (*de minimis* value) and/or air quality impact for a pollutant.

The *de minimis* values in Table 20 are used for two main purposes:

1. To determine whether a modification to a major source is subject to PSD and/or nonattainment permit requirements.

2. To identify the pollutants to which BACT must be applied and an air quality review must be conducted for a major new or modified source once the source is subject to PSD.

The values in Table 21 are used to limit the requirement for air quality review. The table is applicable to a source with the potential to emit regulated pollutants in amounts greater than the *de minimis* values of Table 20. The table is not applicable to sources in nonattainment areas, to sources that adversely impact a Class I area, or to sources that emit pollutants in excess of the cutoff of 100 or 250 tons per year.

4.4.2 Applicability of BACT/Air Quality Peviews

The current and the proposed regulations provide different criteria for deciding the applicability or nonapplicability of the BACT and air quality review requirements. The proposed regulations would tend to both increase and decrease the number of sources subject to BACT and air quality impact reviews. For new sources, the changes would:

1. Decrease the number of sources subject by eliminating from BACT and air quality reviews those sources that have controlled emissions less than 100 or 250 tons per year by eliminating those between the present cutoff of 50 tons per year and the cutoff of 100 or 250 tons per year (proposed definition of "major stationary sources").

2. Increase the scope of reviews for sources subject (greater than 100 or 250 tons per year

TABLE 20. *DE MINIMIS* LEVELS

Pollutant	Tons/yr
Carbon monoxide	100
Nitrogen dioxide	10
Total suspended particulates	10
Sulfur dioxide	10
Ozone (VOC)	10
Lead	1
Mercury	0.2
Beryllium	0.004
Asbestos	1
Fluorides	0.02
Sulfuric acid mist	1
Vinyl chloride	1
Total reduced sulfur	
Hydrogen sulfide	1
Methyl mercaptan	1
Dimethyl sulfide	1
Dimethyl disulfide	1
Reduced sulfur compounds	
Hydrogen sulfide	1
Carbon disulfide	10
Carbonyl sulfide	10

TABLE 21. AMBIENT AIR QUALITY *DE MINIMIS* LEVELS

Pollutant[a]	Levels, $\mu g/m^3$
Carbon monoxide	500, 8-h avg
Nitrogen dioxide	1, annual avg
Total suspended particulates	5, 24-h avg
Sulfur dioxide	5, 24-h avg
Lead	0.03, 3-mo avg
Mercury	0.10, 24-h avg
Beryllium	0.005, 24-h avg
Asbestos	1, 1-h avg
Fluorides	0.01, 24-h avg
Sulfuric acid mist	1, 24-h avg
Vinyl chloride	1, max value
Total reduced sulfur	
Hydrogen sulfide	1, 1-h avg
Methyl mercaptan	0.5, 1-h avg
Dimethyl sulfide	0.5, 1-h avg
Dimethyl disulfide	2, 1-h avg
Reduced sulfur compounds	
Hydrogen sulfide	1, 1-h avg
Carbon disulfide	200, 1-h avg
Carbonyl sulfide	100, 1-h avg

[a] No *de minimis* air quality level has been proposed for ozone; any net increase of 10 tons/yr of VOC subject to PSD would require an ambient impact analysis, including the gathering of air quality data.

controlled emissions), by requiring reviews for all regulated pollutants emitted in greater than *de minimis* amounts.

For modified sources, the changes would:

1. Decrease the number of modifications subject, by eliminating from review proposed modifications at plants where the overall existing controlled emissions including the emissions from the proposed modification are less than 100 or 250 tons per year, and by eliminating from review those modifications at major sources whose emissions would be offset by emission reductions at the source such that the net increase in emissions would be less than the *de minimis* levels. However, as stated earlier the data to determine whether a modification occurs at a major existing source are somewhat limited.

2. Increase the number and depth of the reviews for modifications at major existing sources by requiring that any net increase in emissions in excess of the *de minimis* levels as a result of a physical change in the sources undergo PSD review.

Under the proposed regulations, if a source is a major stationary source or becomes a major stationary source as a result of a modification, review requirements are imposed on all modifications that would increase net controlled emissions for any regulated major pollutant(s) by greater than the *de minimis* value for that pollutant(s). Current regulations require review only if the increase in controlled emissions is equal to or greater than 50 tons per year and if the pollutant types(s) that will be emitted is 50 tons per year or more.

4.4.3 Data Base for the Analysis

Data were abstracted from 226 PSD forms that (by the definition in the proposed regulations) were either major new or modified sources (i.e., greater than 100 or 250 tons per year of controlled emissions). Both new and modified sources were used in this analysis of *de minimis* as the proposed definition affects both new and modified sources.

From the individual forms a listing was prepared that displayed:

1. Each emission unit

2. The pollutant(s) emitted from each unit

3. The annual tonnage of controlled emissions from each unit and for each pollutant.

If the annual emissions were not recorded (usually for trace elements from combusted fuels), emission factors were used in performing the necessary calculations to estimate the annual emissions.[6,7]

4.4.4 Reviews Required by Proposed and Current Values

The data base was examined to determine both the number of sources that would be subject to review and the approximate number of BACT and ambient air quality reviews that would be required if the proposed *de minimis* values (Table 22) were used as the criteria for the reviews.

Each modified emission unit within an industrial plant (major stationary source) was assumed to be subject to a BACT review for each regulated pollutant emitted from the source in greater than *de minimis* amounts. Thus, if a modified cement kiln at a major existing source emitted SO_2, PM, and NO_2 in greater than *de minimis* levels, the kiln would be subject to three BACT reviews; if the plant had emitted greater than the *de minimis* values for SO_2, PM, and NO_x and had three modified emission units that each emitted SO_2, PM, and NO_2, nine BACT reviews would be required.

On a plantwide basis, one air quality review was assumed for each pollutant emitted in greater than *de minimis* amounts. Thus, even if each of three emission units emitted a common pollutant (and that pollutant only) in amounts greater than *de minimis*, only one review was assumed; if each of the three emitted three different pollutants all of which were greater than *de minimis* amounts, on a plantwide basis, nine BACT and three air quality reviews would be required.

As can be seen from Table 22 the effect of doubling the *de minimis* emission limits for TSP, SO_2, and NO_x would have the effect of decreasing the number of BACT and air quality reviews by 24, 8 and 6 percent, respectively. The amount of TSP, SO_2, and NO_x emissions subject to review, however, would only be reduced by 3, 0.1 and 0.0 percent, respectively.

4.4.5 Number of Sources Subject to Review as a Result of Imposing Various *De Minimis* Emission Levels

To examine the effects that alternate *de minimis* values would have on the number of sources subject, a series of graphs were constructed for each pollutant. Both new and modified sources were included to increase the number of sources for which the analysis was performed even though only those sources classified as modified would be directly affected as far as overall applicability to PSD is concerned. Only those new sources that

TABLE 22. EFFECTS OF VARYING *DE MINIMIS* VALUES ON THE NUMBER OF REVIEWS AND EMISSION TONNAGES SUBJECT TO BACT

Pollutant	*De minimis* value, tons/yr	Number of reviews required		Emissions subject to BACT, tons/yr
		BACT	AQI	
PM	5	398	209	45,763
	10	355	187	45,193
	20	269	142	44,053
	50	151	79	40,659
SO_2	5	359	189	490,585
	10	345	182	490,387
	20	318	167	489,972
	50	265	139	488,143
NO_x	5	365	192	544,442
	10	354	186	544,282
	20	332	175	544,122
	50	289	152	542,545
CO	50	138	73	114,453
	100	123	65	112,847
	200	92	48	109,685
VOC	50	80	42	31,008
	100	64	34	29,375
	200	36	19	26,092
Be	0.002	76	40	106.0
	0.004	75	39	105.9
	0.008	73	38	105.9
Hg	0.100	27	14	13.2
	0.200	20	11	11.9
	0.400	7	4	9.4

Note 1: Data bases--final PSD determination by the U.S. EPA Regional Offices from March 1 to November 1979; total permits in data base are 226; total number of emission units are 1216.

Note 2: It should be noted that the above number of BACT and AQ reviews do not reflect the impact of the future use of the netting provision to avoid BACT and AQ reviews.

might be representative of the type of emission changes or modification that would be expected in the future and that had less than 100 tons per year of emissions per pollutant were included. On that basis, there were 219 sources of PM, 216 for SO_2, 217 for NO_x, 167 for CO, 166 for VOC, 65 for Be, 60 for Hg, 1 for TRS, 1 for F, and 1 for Pb. These plots for PM, SO_2, NO_x, CO, VOC, Hg, and Be are shown in Figures 3 through 9. Insufficient data were available to construct similar plots for the other pollutants listed.

While the *de minimis* levels are pollutant specific, very few sources emit just one pollutant. Therefore, the above pollutant specific analysis does not necessarily provide an indication of the absolute number of sources that would be subject to review given certain *de minimis* levels. Thus, while a source would no longer be subject to review for TSP because it had net emission changes of less than 10 tons per year, it would still be subject to review because it had changes in SO_2 emissions of 20 tons per year. In order to obtain some estimate of the total number of modifications that would be subject given specific revised *de minimis* emission levels, all 151 modifications of the 471 permits that were reviewed in detail were evaluated and categorized according to the greatest amount of emission from any of the criteria pollutants that would be emitted from the source as a result of a net change in emissions. For example, if a source had emission changes of 10 tons per year of PM, 25 of SO_2, 30 of NO_x, and 110 of VOC, it was categorized as having an emissions change of greater than 100 tons per year. Therefore, unless the *de minimis* levels were raised to above 100 tons per year for VOC, it would still be subject to PSD even if the *de minimis* levels for all other pollutants it emitted as a result of the change were raised to 35 tons per year. The data from the above analysis were plotted and the results shown in Figure 10. Only 5 criteria pollutants were considered in the analysis of the 151 modifications since none of the modifications reported emission estimates for lead and very few provided estimates for noncriteria pollutants.

If the same general emissions distribution of modifications that have received PSD permits to date holds true for those modifications that were not previously subject to review, then one can obtain some estimate of the impact of selected *de minimis* levels for all modifications (currently subject plus those not currently subject to PSD) that would be subject to PSD review as a result of the proposed regulations. Figure 11 combines both these data sets on modifications by using the distribution for the ones that have received permits to date.

Although Figure 11 provides an estimate of the total modifications that could be subject based on various *de minimis* levels, it is assumed that all proposed *de minimis* levels would be the same for all pollutants. If different *de minimis* levels are suggested for each pollutant, a specific analysis of the 151 modifications that had received permits would be needed for each

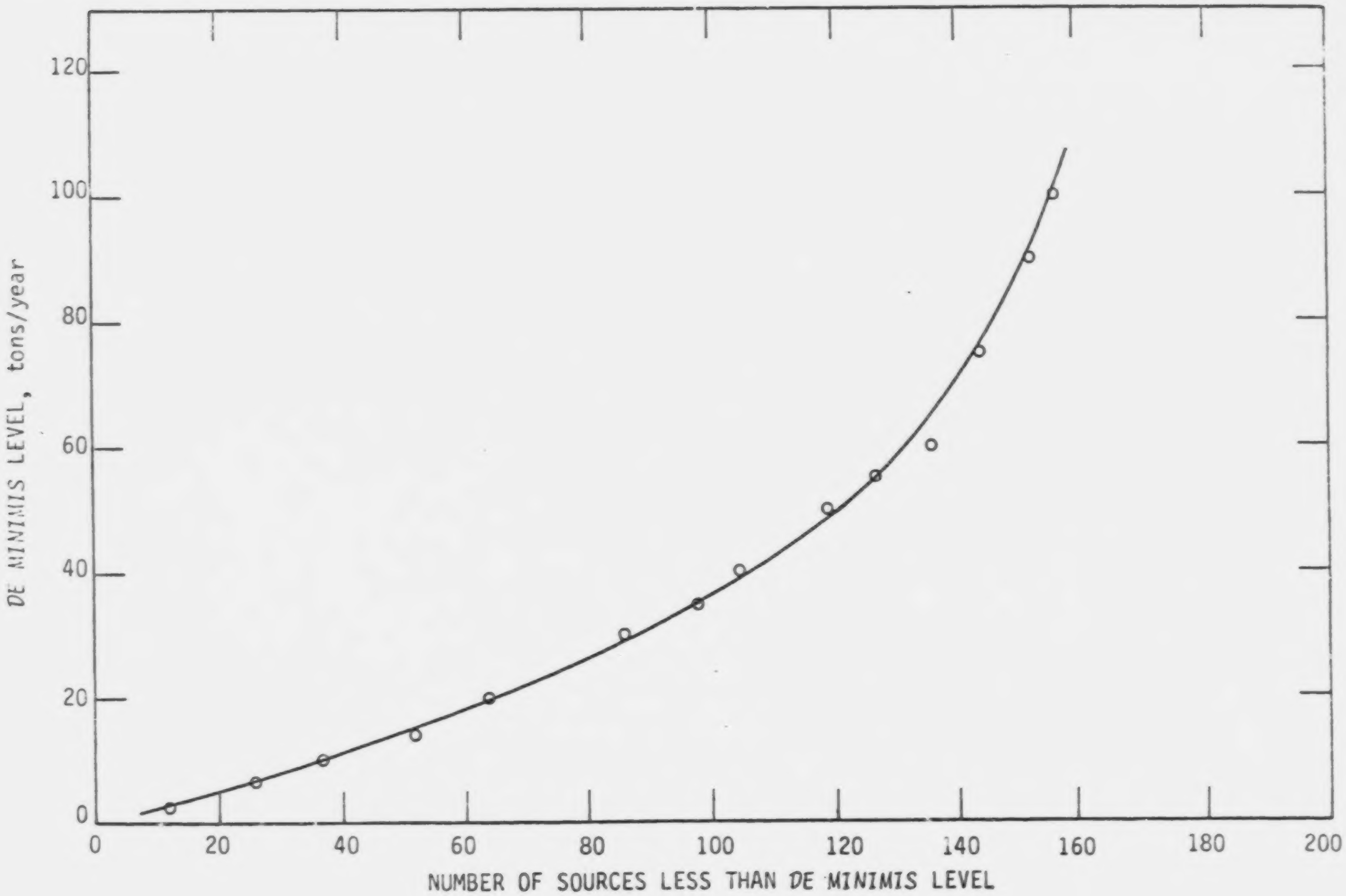

Figure 3. Distribution of particulate matter emission sources versus various *de minimis* emission levels.

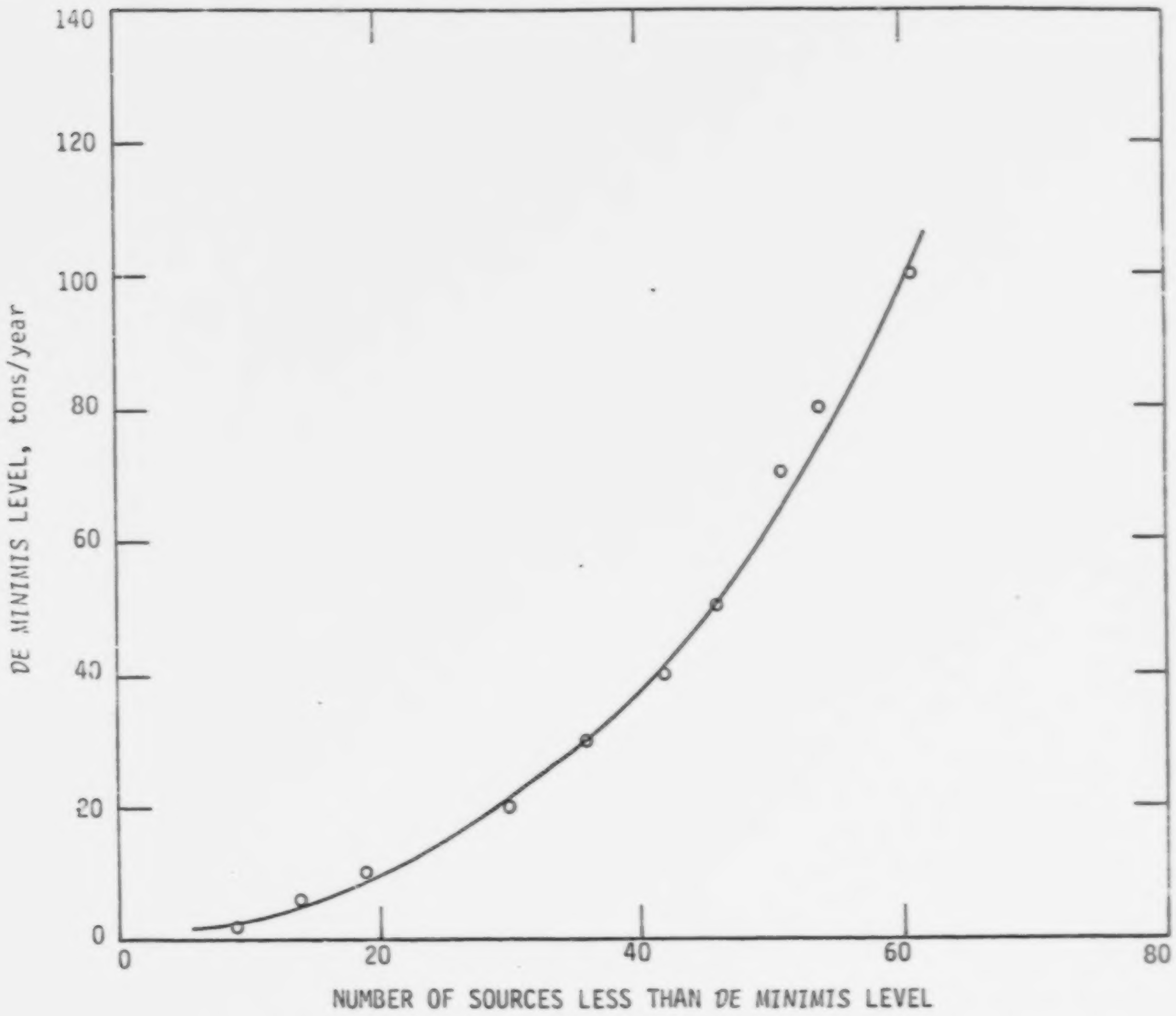

Figure 4. Distribution of sulfur dioxide emission sources versus various *de minimis* emission levels.

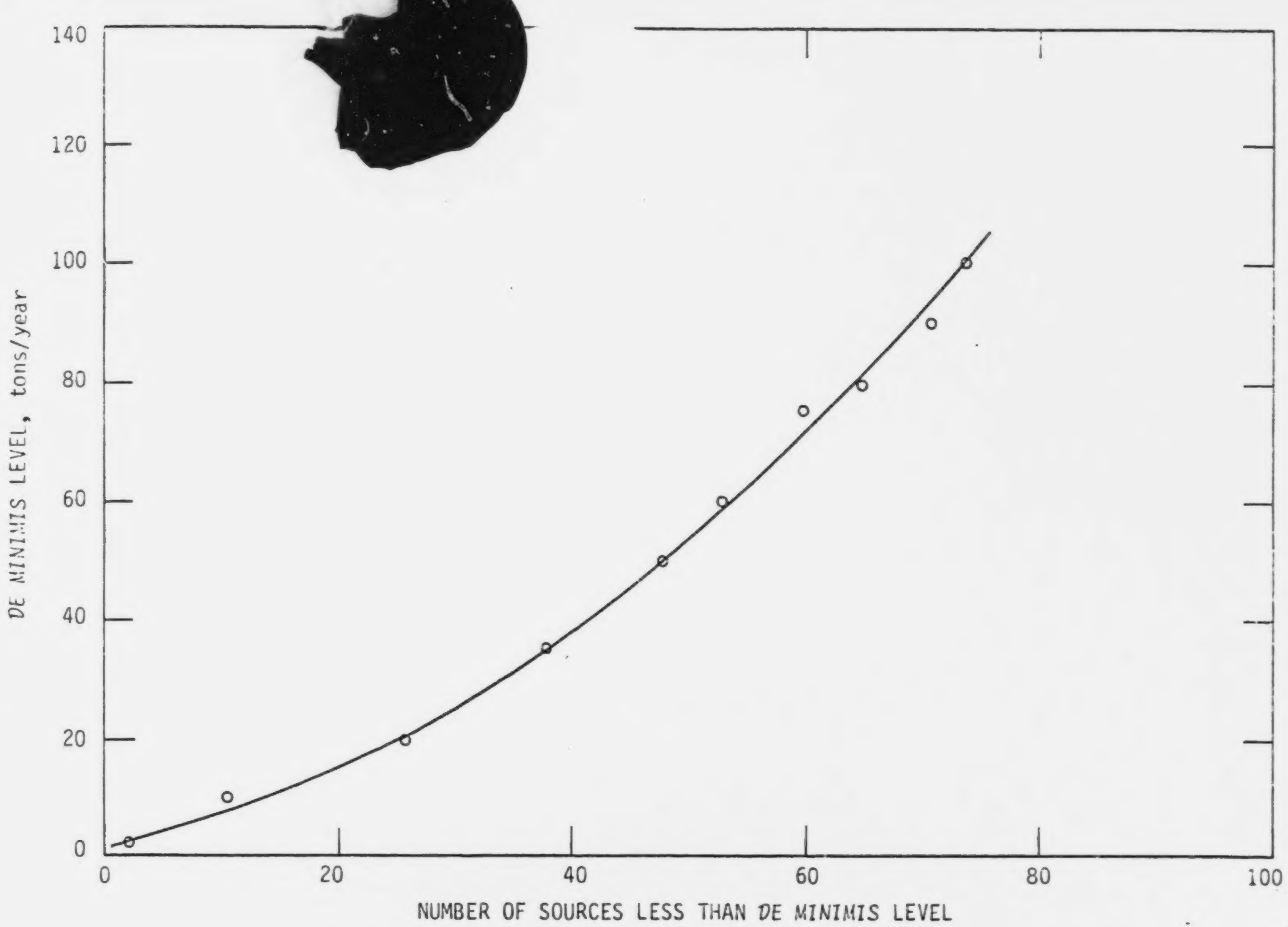

Figure 5. Distribution of nitrogen oxide emission sources versus various *de minimis* emission levels.

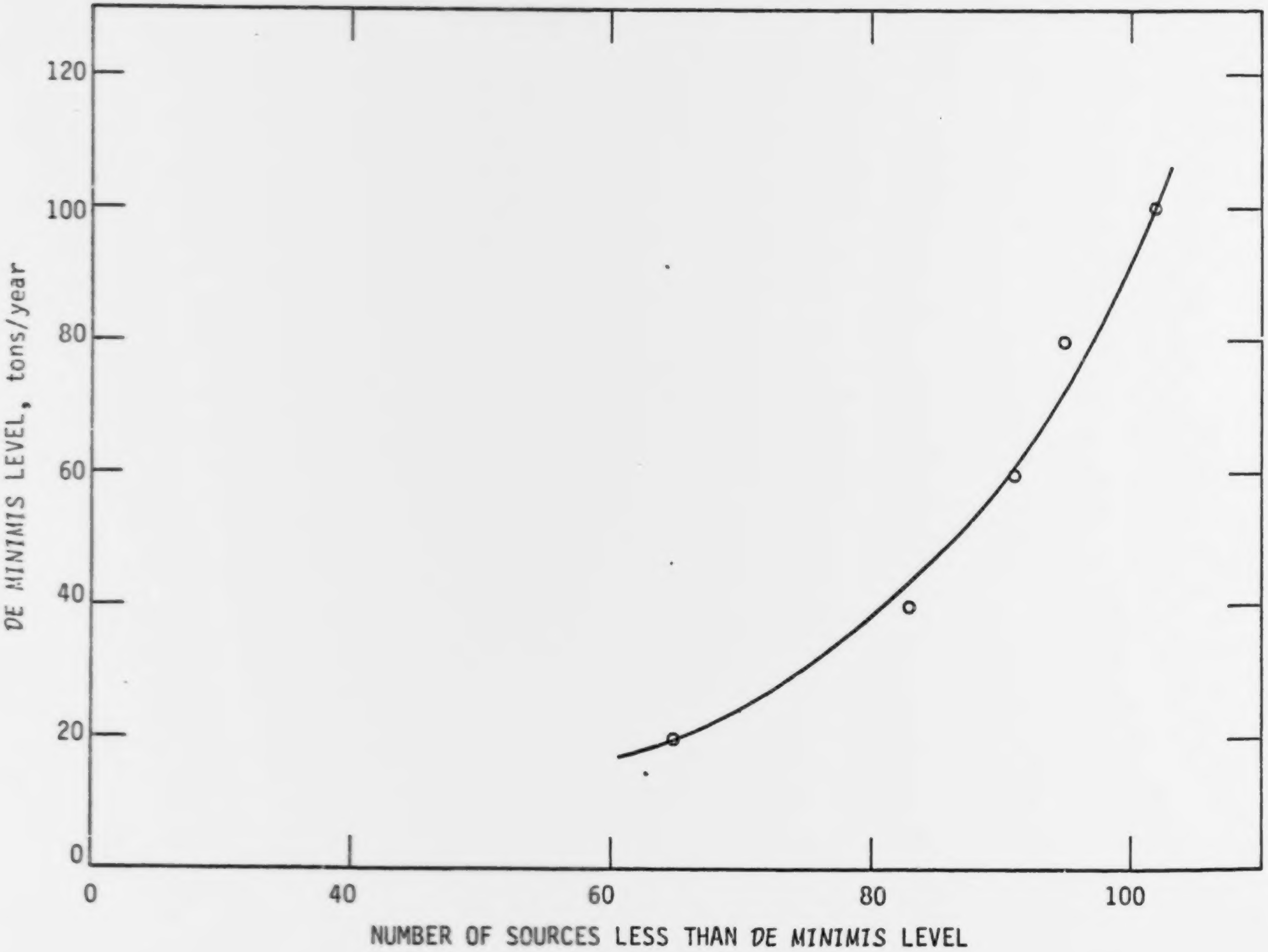

Figure 6. Distribution of carbon monoxide emission sources versus various *de minimis* emission levels.

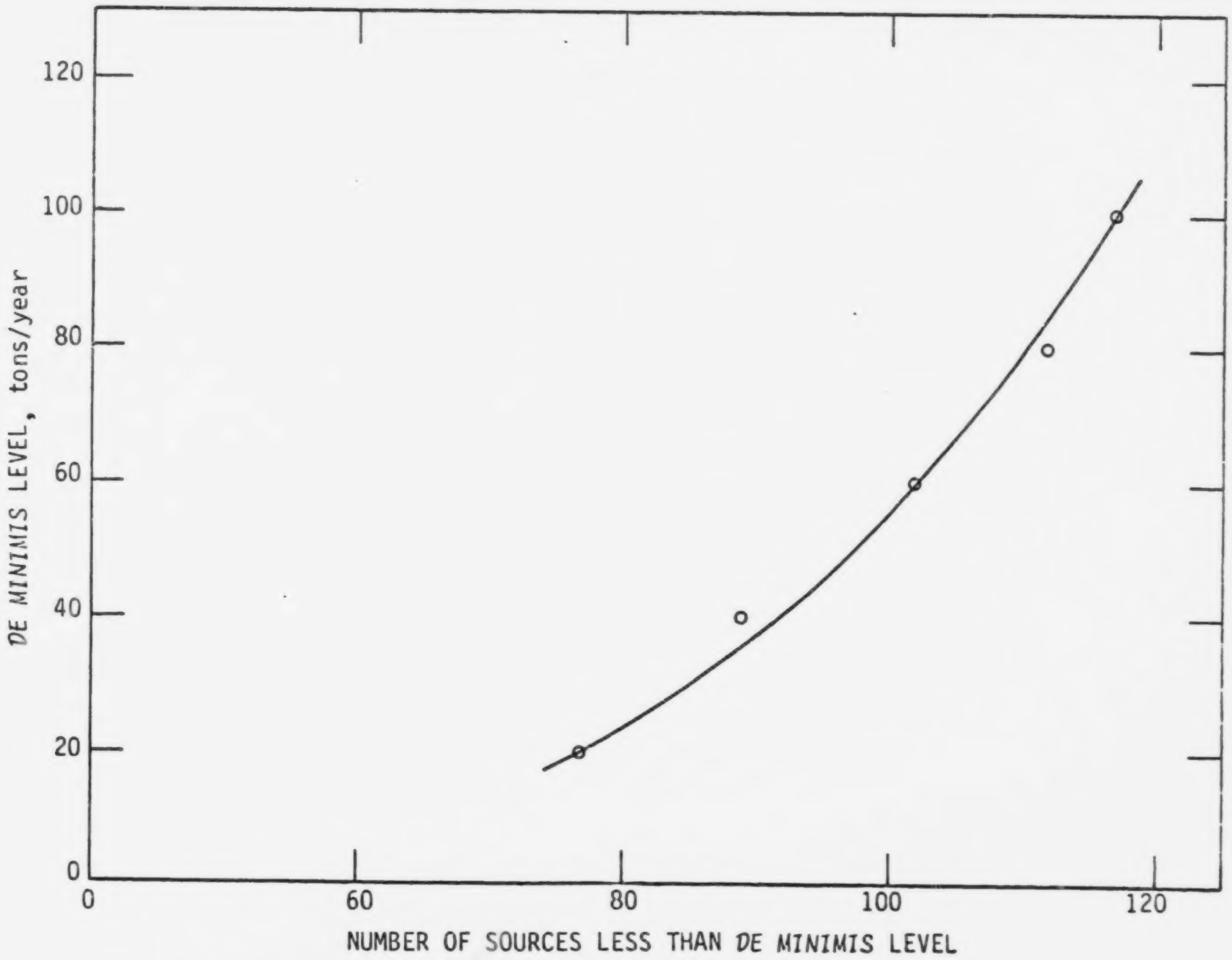

Figure 7. Distribution of volatile organic compound emission sources versus various *de minimis* emission levels.

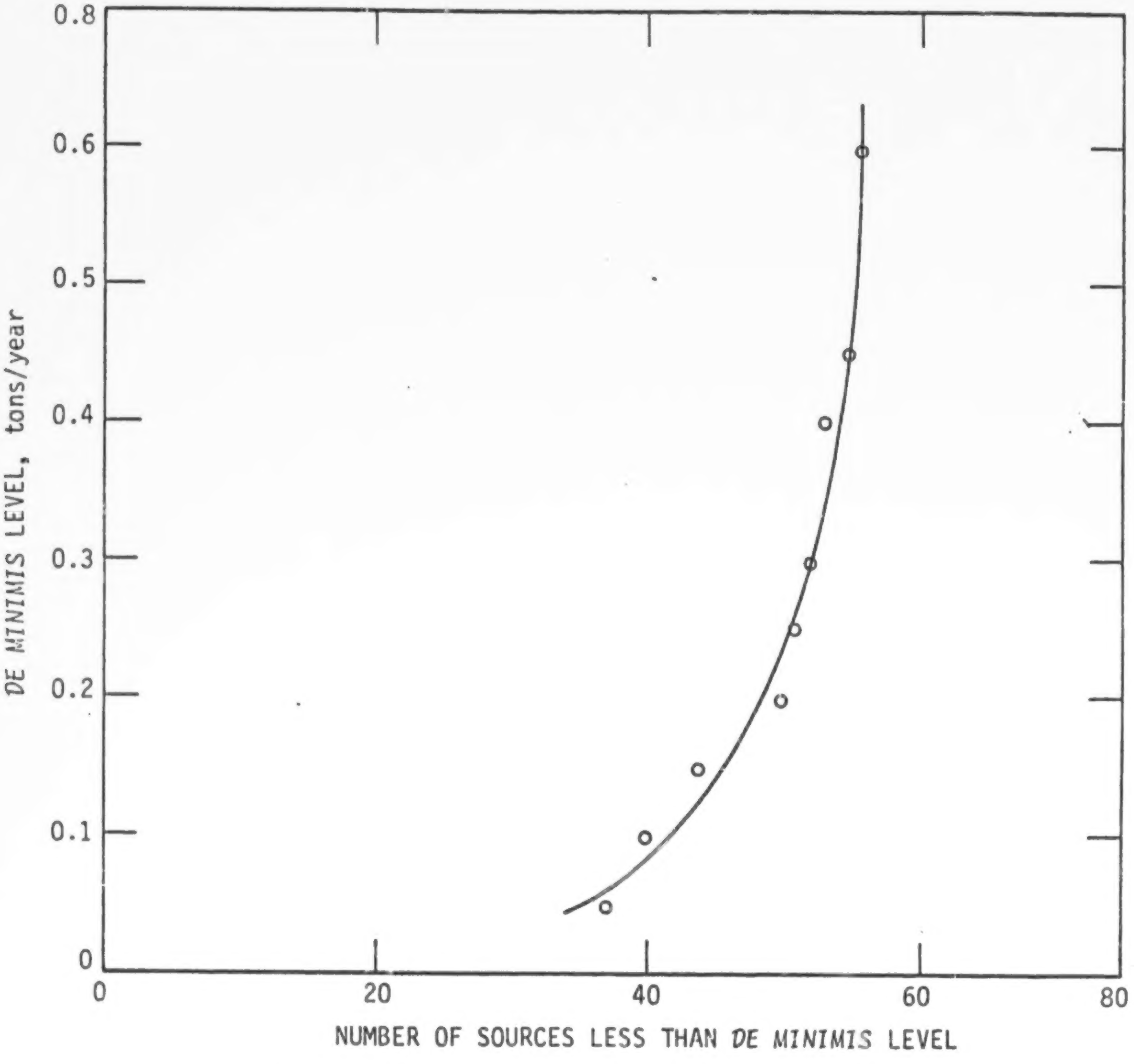

Figure 8. Distribution of mercury emission sources versus various *de minimis* emission levels.

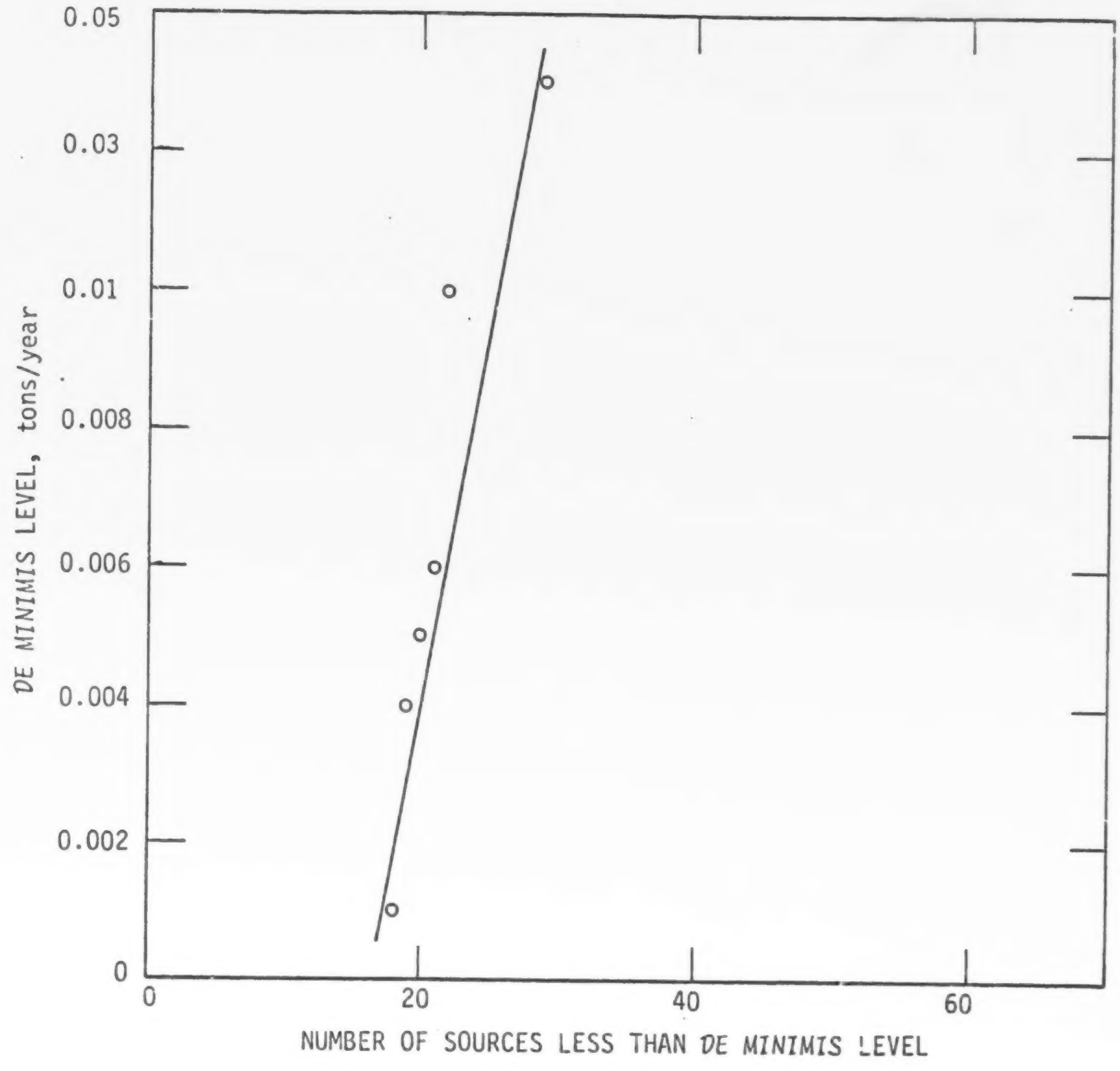

Figure 9. Distribution of beryllium emission sources versus various *de minimis* emission levels.

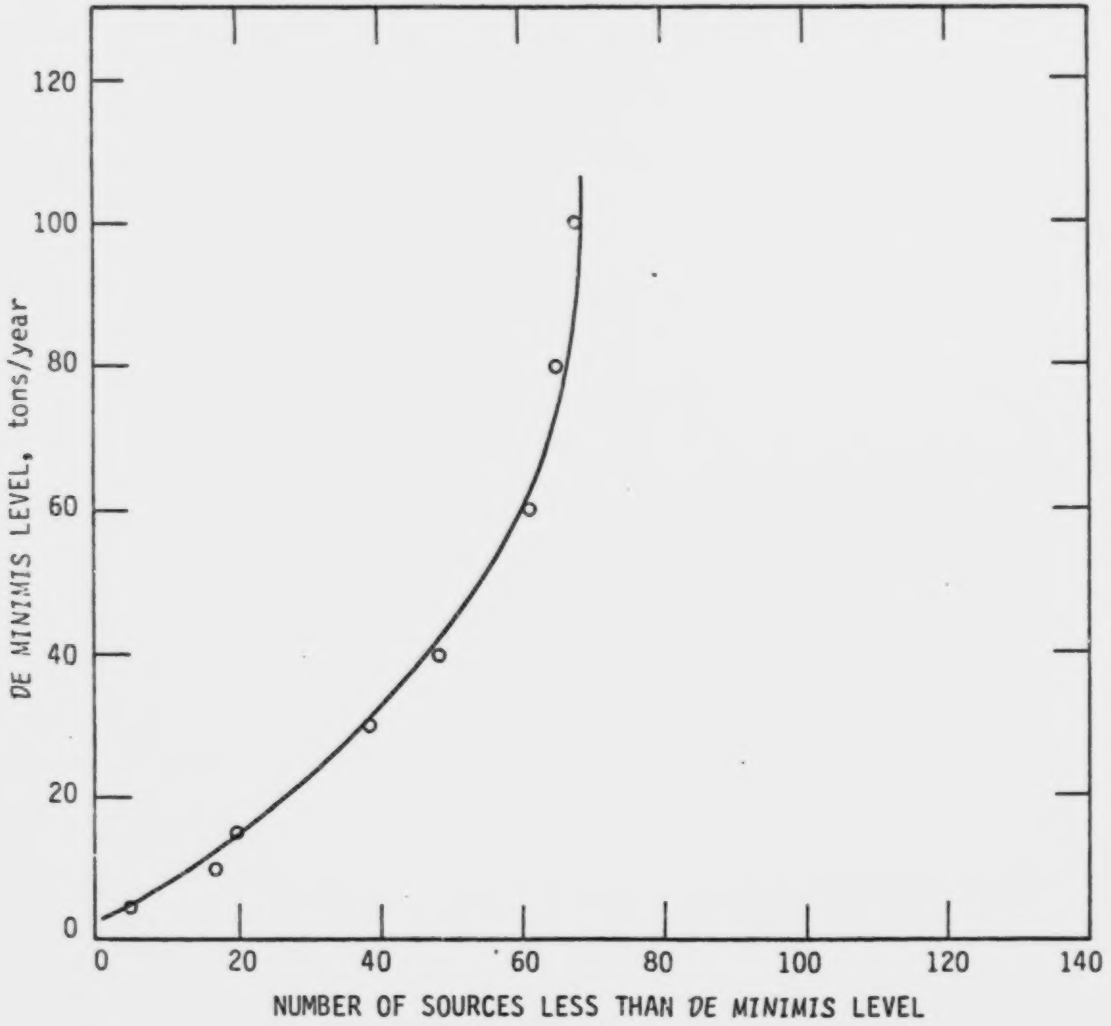

Figure 10. Distribution of modifications which had received permits as of November 1, 1979 versus various *de minimis* emission levels.

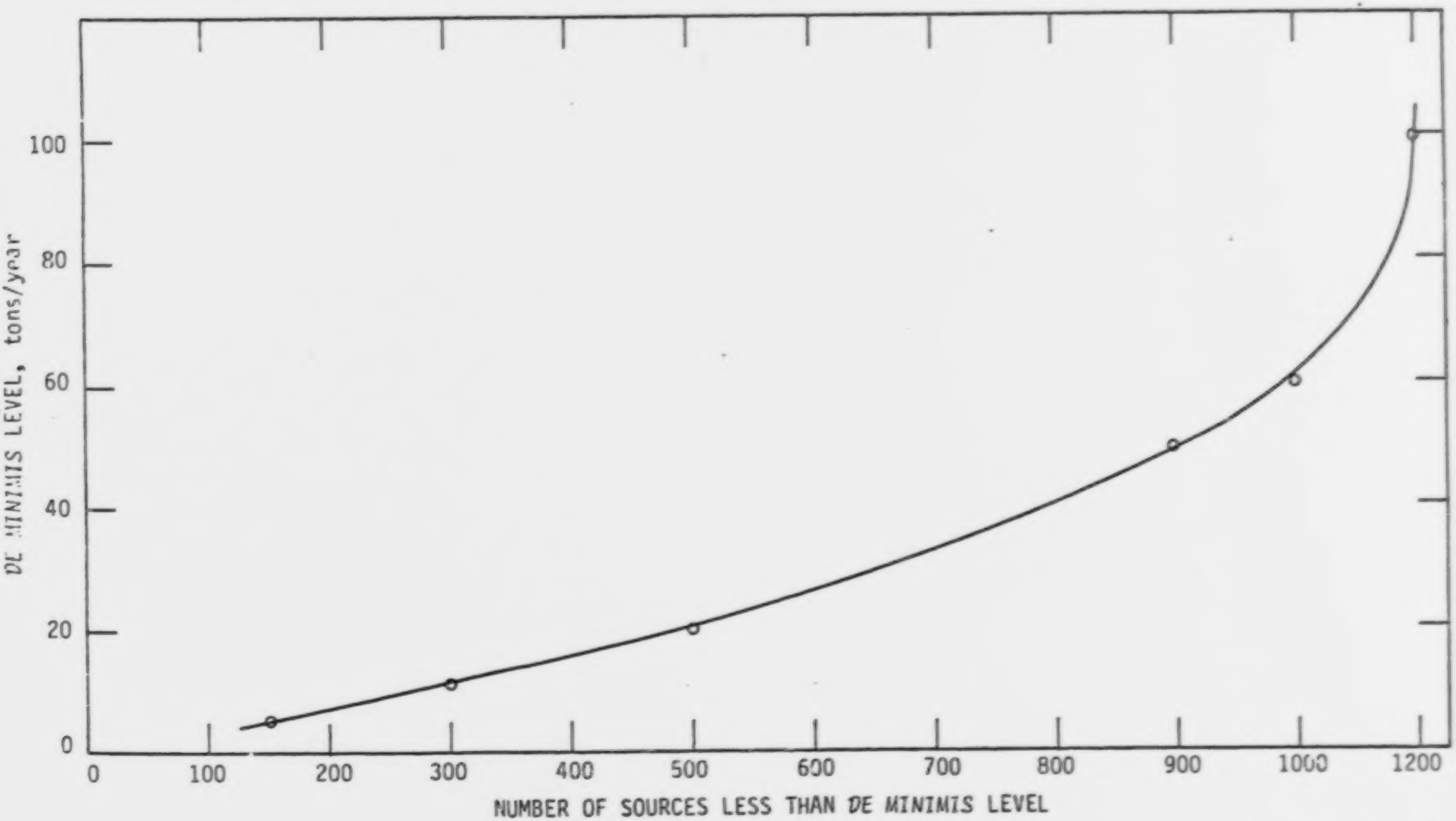

Figure 11. Distribution of the estimated number of modifications at major sources that would currently not be subject to PSD but would be subject as a result of the September 5 proposal.

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combination of *de minimis* levels considered. In order to determine the difference in selecting various *de minimis* levels by pollutant versus selecting one common level, the following *de minimis* level combination was evaluated: TSP at 25 tons/yr, SO_2, NO_x, HC at 40 tons/yr, and CO at 100 tons/yr. As a result, approximately 74 percent of the modifications would be subject as compared with 68 percent if 40 tons per year were used for all pollutants as indicated in Figure 10. Given that the modifications which are currently not subject to PSD have the same general distribution of sources and emissions as the modifications that are currently subject to review, then approximately 888 of the 1200 additional modifications would be subject to the proposed regulations, given the above *de minimis* levels of TSP, SO_2, NO_x, VOC, and CO of 25, 40, 40, 40, and 100 tons/yr, respectively. (816 sources would be subject if 40 tons/year for all pollutants would be considered *de minimis*.)

4.4.6 Reviews Required by Alternate Values

Examination of the *de minimis* data base revealed that up to nine pollutants may be emitted in greater than proposed *de minimis* amounts and that the average emission unit emits more than two pollutants in greater than *de minimis* amounts. The proposed regulations require that a major source or modification be reviewed for each pollutant regulated under the Act that is emitted in greater than *de minimis* amounts. Thus, each emission unit may be subject to a multifaceted BACT review.

The effect that alternate *de minimis* values would have on the number of BACT and air quality reviews once a source is subject to PSD was explored using the 796 emission units in the data base of 226 sources. Criteria chosen were: no cutoff; 50, 100, 200 and 300 percent of the proposed *de minimis* values; cutoff of 50 tons per year for all pollutants; and a cutoff of 100 or 250 tons per year for major stationary sources. The effects of these criteria on applicability are indicated in Table 23. As shown, the proposed *de minimis* values would subject 566 emission units to PSD review--256 for one pollutant, 95 for two pollutants, and so forth. Approximately 1350 BACT and 710 air quality reviews would be required. Compared with the current Tier I cutoff of 50 tons per year, 30 percent more emission units in the data base would be subject to review. If *de minimis* values were doubled, the number of emission units subject would be approximately 494; this would require 1150 BACT and 605 air quality reviews. The comparative increase (doubled *de minimis* vs. 50 tons per year cutoff) in emission units subject, would be 13 percent. The values shown should not be considered absolute, since the data base was compiled under the current regulations and may not encompass all emission units or all pollutants that would be subject to the proposed regulations and does not reflect the impact of sources using the netting provision to avoid BACT and air quality reviews.

TABLE 23. EFFECTS OF SELECTED *DE MINIMIS* LEVELS

Cutoff	Number of emission units emitting more than cut-off for one or more pollutants										Number of emission units subject,[a] % change	Number of reviews required	
	1	2	3	4	5	6	7	8	9	Total		BACT	AQI
None	366	67	111	62	112	6	70	1	1	799	+82	2200	1160
50% of *de minimis*	310	107	108	59	25	15	28	1	1	654	+50	1460	770
De minimis	256	95	119	48	13	15	19	0	1	566	+30	1350	710
200% of *de minimis*	223	108	90	39	10	19	4	0	1	494	+13	1150	605
300% of *de minimis*	208	117	81	27	10	16	2	1	0	462	+ 6	885	465
50 tons/yr	210	101	64	25	37	0	0	0	0	437	0	935	490
100 or 250 tons/yr	140	94	36	8	25	0	0	0	0	303	-31	600	315

[a] Percent change is percentage increase or decrease in emission units subject, by using the cutoff based on comparison of the 50 tons/yr cutoff in current regulations.

[b] BACT is a review to determine if Best Available Control Technology has been applied; AQI is review of predicted impact on air quality.

4.4.7 Implications of the Analysis

Previous PSD determinations represent the best available data base for an analysis of this nature, but data limitations did exist for the intended purpose--the proposed regulations contain new or substantially altered provisions at variance with those that formed the basis for the original determinations. For example, the current regulations exempt major modifications of less than 100 or 250 tons per year of uncontrolled emissions; thus, modifications at existing sources that would not increase the emissions by 100 or 250 tons per year (regardless of the existing source size) were not subject to PSD review, and thus are not in the data base. In contrast, the proposed regulations use *de minimis* cutoffs that are generally less than 50 tons per year, and subject the modifications at major sources with greater than *de minimis* emissions to review. Accordingly, the number of modifications with emissions between 50 tons per year of controlled emissions (less than 100 or 250 tons per year uncontrolled) and the generally lesser *de minimis* values are unknown. Without making some estimate of the additional modifications that would be subject, the analysis would tend to underestimate the number of modifications that could potentially be subject to review under the proposed regulations. (See discussion of additional modifications to be subject in Section 4.3 and 4.4.5.)

The major assumption in this analysis was that past PSD determinations--the *de minimis* analysis data base--are generally representative of PSD applications that will be submitted in the future. This assumption presumes that the nature and characteristics of future source types and sizes, pollutant types, emission quantities, and other related parameters will be similar to those of the past. In the analysis, it was also assumed that a BACT review would be required for each pollutant emitted in greater than *de minimis* amounts and that an air quality review would be required for each pollutant type emitted in greater than *de minimis* on a source (plantwide) basis.

4.5 BASELINE DEFINITIONS

"Baseline concentration" generally means the actual ambient air quality concentration in an area on a baseline date. All emissions not included in the baseline would consume the available increment for the baseline area.

The current regulations set a uniform baseline date of August 7, 1977. The court (in Alabama Power) found that a uniform date impermissibly deviated from the Act. Thus the proposed regulations set the time of the first permit after August 7, 1977, as the baseline concentration for the area subject to the PSD regulations, and defined the area as an AQCR. The proposal further states that when a major stationary source or major modification for any pollutant regulated under the Act applies for a

PSD permit in any part of an AQCR designated as unclassifiable or attainment, it establishes the baseline date for PM and SO_2 in all parts of the AQCR.

Since there are significant differences between the current and proposed baseline definitions, an analysis was undertaken to determine the impacts of the proposed change. Because the court gave EPA no discretion in using the date of the first permit rather than the uniform date, the analysis centered on the potential impact of defining the area as an AQCR.

4.5.1 Approach to the Analysis

The basic approach used in this assessment was to determine the effective baseline date for an area depending upon how the area would be defined, and then to calculate how much land area would be included for four time periods under two definitions--AQCR and county. A third definition--area of source impact--was not included because limited data were available in the permit files, and without data on the impact area of a source (area where concentrations would decrease to insignificant levels), it was impossible to quantitatively analyze the potential national impact of using this third definition.

Each final permit in the PSD survey that would be subject to the proposed regulations was reviewed to determine the date on which the application was completed. These dates were listed by county for sources subject to the proposed regulations to obtain the date of the first permit in the county, and the counties were grouped by AQCR's to determine the date of the first permit in the AQCR. Data on each county and AQCR were collected to determine the amount of land area that would be included under the proposed and one alternative definition of baseline area.

Four dates from August 8, 1977, to September 5, 1979, were selected for estimating the land area to be included in the definition and to analyze the potential impact of choosing one area definition over another. This assessment does not, however, speak to the issue of administrative feasibility regarding the selection of the baseline area. This assessment must be by its very nature qualitative rather than quantitative. It must address concerns such as: simplicity, uniformity, ease of tracking the increment, and availability of data for assessing the impacts of unreviewed sources in terms of increment consumption.

4.5.2 Qualitative Analysis of the Proposed and Alternative Area Definitions

The proposed regulations define the area subject to PSD as an AQCR. Because the baseline date would be uniform throughout an attainment or unclassified AQCR, the administrative problems resulting from many baseline starting dates are minimized. It has been argued, however, that the AQCR could encompass a broader area than needed to avoid multidate confusion.

A source impact area, in contrast, would require a detailed system to track the many baseline dates within the area. As more and more permits are issued, the sources' impacts would overlap and the tracking or recordkeeping would become more complex. Both sources and agency personnel would find it difficult to ascertain at any given time what area must receive minor source reviews and when such sources would begin to consume the available increment. Each proposed new source would find it increasingly difficult to predict how much increment might be left for consumption, to calculate even roughly how much minor source growth might have taken place, and to decide what date should be used in these calculations.

Emissions and air quality data are not readily available on source impact areas, but they are readily available and easily retrieved for a county or AQCR. Availability of data makes the recordkeeping, especially for periodic evaluations, easier for the general public.

Public participation is a basic objective of the PSD program set forth in the Act:

> . . . to assure that any decision to permit increased air pollution in any area . . . is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed (underlining added) public participation in the decisionmaking process.

Varying baseline dates within a county would make it difficult for the general public or the sources to reasonably track the PSD process and to intelligently determine how area growth has been or will be allocated. One uniform baseline date for the smallest political jurisdiction possible would increase the public's understanding of the baseline concept and allow them to more reasonably participate in the permit-granting process.

4.5.3 Quantitative Analysis of the Definitions

A quantitative analysis was performed and it provided data on the percentage of AQCR's or counties that would have the baseline date established at certain times; on what this percentage might mean in terms of total U.S. land area and the relative size of the area; and on dates from which minor source growth would consume the available increment.

Table 24 presents the results of the analysis using the proposed AQCR and one alternative definition. If a permit had been received for an area either for TSP or SO_2, the area was determined to have the baseline established. In the table, the number of AQCR's and the land area significantly increase as the number of sources applying for permits increases; thus, the sources are not necessarily locating in the same AQCR's, but are geographically spreading across the country. This spreading is even more dramatic in the county analysis.

TABLE 24. EFFECTS OF BASELINE AREA DEFINITIONS

	AQCR		County	
	Number	mi^2	Number	mi^2
September 1, 1977	1	21,823	2	11,021
January 1, 1978	5	193,445	7	24,474
July 1, 1978	23	425,420	31	73,140
January 1, 1979	66	1,134,175	106	172,462
September 5, 1979	98	1,539,150	172	227,009
Total	193	3,314,013	318	508,106

4.5.3.1 Effects of AQCR--

With 247 AQCR's in the country and with a total U.S. land area of 3,615,211 square miles, approximately 40 percent of the AQCR's and 43 percent of the land area already have a baseline date established as of September 5, 1979. Therefore, minor source growth would consume increment in these areas. More than 25 percent of the AQCR's have a baseline date prior to January 1, 1979. For approximately 50 percent of the AQCR's, only one permit has been issued to date. Therefore, this one permit would cause a great deal of area to be affected in terms of increment tracking under the current proposal.

Because of the large sizes of many of the AQCR's and because one source could trigger a review of minor source growth for an entire AQCR, an analysis was conducted to determine if using a county rather than an AQCR might have the baseline match more closely the area where the source is expected to have its impact, and yet be reasonable to administer.

4.5.3.2 Effects of County--

The county analysis indicated that only 6 percent of the approximately 3000 counties or county equivalents and 6 percent of the land area would have a baseline date prior to September 5, 1979. By using this approach the amount of area (in number and size) in which minor source growth would be consuming the available increment would be substantially reduced. Although this approach would not prevent one source from affecting an entire area's baseline date, it would significantly reduce the area that would be affected.

The AQCR and county analyses above were based on the assumption that if a permit were issued for either TSP or SO_2, the baseline was triggered for both pollutants. If, however, the baseline is pollutant specific, slightly less area per pollutant would be included in the baseline for the four time periods used in the analysis. However, because most of the permits issued to date were for TSP and SO_2 and many sources emitted both pollutants, the amount of land area per pollutant would only be 1 or 2 percent less than the numbers presented above.

4.5.3.3 Effects of Source Impact Area--

If one assumes that the area of impact of a source is a circle with a radius of 15 miles (half the maximum distance for which current models can reasonably perdict), the area would be approximately 700 square miles; this would equal or exceed the land area for most counties in the analysis. If two or more sources in a county have been issued permits, the source impact areas would overlap and the amount of area would quickly exceed that of a county. Even if the radius is only 5 miles (not unreasonable for a moderate size source), the impact area would be 75 to 80 square miles, so several sources could still closely approximate the land area contained in many smaller to moderate sized counties if the sources were separated by any distance at all. Thus, the county, based on available data, approximates the relative amount of land area that would be in an impact area, but does not introduce the administrative complexities of having a number of baseline dates within a county or political jurisdiction.

4.6 OTHER ISSUES AND THEIR RELATIVE IMPACTS

4.6.1 Pollutant Applicability

The proposed regulations determine on a pollutant-by-pollutant basis whether a source is subject to PSD review. However, once a source is subject for the pollutant for which it is major, it must meet the BACT and air quality requirements for all other pollutants emitted in levels above the *de minimis* amounts. Because more than half the emission units in the *de minimis* analysis had more than one pollutant greater than the proposed *de minimis* limits, the impact of considering pollutants other than the one that is major, could be considerable, depending on which *de minimis* levels are finally promulgated (Section 4.4).

4.6.2 Innovative Technology Waiver

In the current regulations, it was proposed that the innovative technology control waiver be applicable to BACT determinations under PSD; since no adverse comments were received, specific language has been proposed in the September 5 regulation to implement the innovative technology waiver for BACT.

Section 111(j) of the Act states

> Any person proposing to own or operate a new source may request the Administrator for one or more waivers from the requirements of this section (New Source Performance Standards--added) for such a source or any portion thereof with respect to any air pollutant to encourage the use of an innovative technological system or systems of continuous emission reduction . . .

The proposed regulations require that a source with a Section 111(j) waiver must as part of the innovative technology waiver include an emission limit and a schedule for meeting the limit. The source must still satisfy the air quality analysis requirements by using its projected emissions after the 111(j) controls are installed. Any increase above the permitted emission level would be treated as temporary and as having an insignificant air quality impact. The regulations also proposed to apply the innovative technology waiver to sources not subject to NSPS and therefore not directly eligible for Section 111(j) waiver. The criteria for these waivers would be similar to those established for 111(j) waivers.

Since no data were available on the innovative technology waiver, a quantitative analysis was not conducted. Because this proposal could increase the likelihood of sources installing innovative technology, it would have a positive environmental impact and little adverse economic impact because it would be something that the source itself would choose to do rather than something imposed on it. Unless there is a positive financial incentive, however, few sources would select innovative controls.

4.6.3 Secondary Emissions

The proposed regulations define secondary emissions as those from new or existing sources that result from construction and/or operation of a major source or modification; they do not necessarily come directly from the source. Secondary emissions would include, but are not limited to the following:

1. Emissions from ships or trains coming to or from a source or modification.

2. Emissions from support sources constructed offsite that would increase emissions as a result of the construction of a major source.

Secondary emissions are not proposed to count in determining the potential to emit. If a source is otherwise subject to PSD review, the BACT requirement would not apply to secondary emissions.

However, well-known and quantifiable secondary emissions would be counted in terms of the impacts on the ambient air quality increments or standards. Sources are required to consider all minor source growth that has taken place since the last permit has been issued in the area when they assess the impact of their facility; secondary emissions would be considered minor sources for this type of analysis. Therefore, since secondary emissions are to be considered in terms of their impact on the increment, the only question remains when and by whom should they be considered? If the source to which they are related does not consider them, the next source to obtain a permit would have to do so; therefore, it seems reasonable that the source which creates quantifiable secondary emissions should include them in assessing the overall impact of the source.

No additional economic impact would be expected as a result of the proposal concerning secondary emissions, since these emissions were included in the current regulations as part of the minor source assessment of increment consumption. The proposed regulations only propose to shift the responsibility for conducting the air quality assessment from the applying source to the source that actually causes these secondary emissions to occur.

4.6.4 Portable Facilities

Under the current regulations, permitted sources must submit a 30-day notice prior to relocation. Based on experience with the current regulations, the proposed regulations reduce the amount of time to 10 days. While the impact of reducing the time from 30 to 10 days was not assessed, it is reasonable to conclude that the shorter time would reduce any previous delay costs associated with the current regulations. Since most portable facilities are asphalt plants and since most permitted asphalt plants would not be subject to the proposed regulations as a result of the proposed change in the definition of potential emissions, the impact of this change is not expected to be significant. However, for the few asphalt plants that would be subject to the proposed regulations, the time delays between construction projects would be significantly shortened.

4.6.5 Nonprofit Institutions

Under the current regulations nonprofit health or educational institutions can be exempted from PSD requirements, upon written request by the Governor of a State. The proposed regulations would extend this exemption to modified nonprofit health or educational institutions (as well as those newly constructed). This extension would have a major impact on the number of these sources that would be subject to review. Without this exemption, these modified institutions would only have to emit in excess of the *de minimis* levels to be subject to review. Since most modifications to these facilities (i.e., adding an incinerator or modifying a steam plant) would cause emissions in excess of the *de minimis* levels, many of these sources would be subject to review without a specific exception.

The impact of not imposing the exemption could be substantial since many modified nonprofit health or educational facilities could be subject to review. However, adverse environmental impacts associated with imposing the exemption would be minimal since most facilities would have only minor additional controlled emissions, but enough to subject them to PSD review because of the *de minimis* requirements. Because no data were currently available, no quantitative assessment can be conducted regarding this provision.

REFERENCES FOR SECTION 4

1. The Impact of Including Fugitive Emissions From Mining Operations on Contiguous Processing Facilities, Draft, March, 1980. Energy and Environmental Analysis, Inc.

2. Personal communication with P. Fairchild, Northeastern States Commission on Air Quality Management, February 25, 1980.

3. Personal communication with H. Johnson, Ohio Environmental Protection Agency, February 22, 1980.

4. Personal communication with M. Sowell, Division of Environmental Management, State of North Carolina, February 19, 1980.

5. Personal communication with J. Preece, Department of Environmental Regulation, State of Florida, February 21, 1980.

6. Compilation of Air Pollution Emission Factors, Second Edition, Publication No. AP-42, U.S. Environmental Protection Agency, February 1976.

7. Emission Factors for Trace Substances, Publication No. 450/2-73-001, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711. December 1973.

SECTION 5

IMPACT OF PROPOSED REGULATIONS ON NONATTAINMENT AREAS (Geographic Applicability)

Several definitions and concepts addressed in the court decision (Alabama Power) were relevant to the statutory requirements for areas where pollutants exceed NAAQS's. Thus, the proposed regulations changed some of the requirements for nonattainment areas. The requirements involve definitions of new and modified stationary sources subject to preconstruction permitting; definitions of source, facility, and installation for avoiding new source review under the no-net-increase provision; and the issue of geographic applicability--that is the areas to which the PSD regulations would apply.

In the preliminary opinion (June 1979) to the decision, the court held that the proposed PSD provisions would apply only to major new or modified sources locating either in areas designated as attainment or unclassifiable or in areas for which the source would substantially impact a clean air portion of another State; the proposed regulations conformed to this decision. However, the court's final decision (December of 1979) held that PSD review would apply only to major sources being constructed in clean air areas. In order to protect clean air areas from major sources that may be constructed in any nonattainment areas, the court indicated that EPA would have to rely on its authority under Sections 110 and 126 of the Clean Air Act to resolve interstate air pollution problems. Accordingly, the proposed PSD regulations would apply only in attainment or unclassifiable areas and would not apply as such in nonattainment areas. It should be pointed out, however, that attainment and nonattainment areas often overlap and that many areas are designated as both attainment or nonattainment depending upon the pollutant. The application of the PSD regulations is dependent on the nature of the pollutants emitted by a source. For example, some sources that emit pollutants which are designated as nonattainment for certain areas would have to meet the nonattainment provisions, while for other pollutants emitted by the source the PSD provisions would apply. The current regulations apply to sources in all areas, so the proposed regulations would exclude some sources from review that were previously subject.

Sources in nonattainment areas might not be subject to the proposed PSD regulations for certain pollutants. To determine the potential impact of this requirement, data from the survey of the final PSD permits were reviewed to identify sources that had received permits and were planning to locate in a designated nonattainment area.

Under the current regulations regarding nonattainment new source review, if a source located in a clean portion of a designated nonattainment area could demonstrate that it would impact only the clean portion of that designated area, it did not have to meet the more restrictive nonattainment requirements--applying the Lowest Achievable Emission Rate (LAER), obtaining offsets, and ensuring statewide compliance by all sources owned by the proposed new source. Under the proposed regulations even if a source demonstrates that it is located in a clean portion of a nonattainment area, it would have to meet the more restrictive nonattainment provisions for the pollutants for which it is major and designated as nonattainment. Likewise sources located in clean air areas but which impact nonattainment areas would only have to meet the PSD requirements.

Of the 604 permits issued under current regulations, 73 permits were for sources located in nonattainment areas--44 new and 29 modified sources. Table 25 indicates that five of the modified and 29 of the new sources would have controlled emissions of less than 100 or 250 tons per year or the *de minimis* levels (as applicable), and therefore would not be subject to the nonattainment nor the PSD requirements. The emissions from those sources that have received PSD permits as of November 1979 and which would no longer be subject to review are summarized in Table 26. These sources would be subject only to the general new source review requirements of the SIP; therefore, the emission limits that many of these sources would be required to meet would be less restrictive than those imposed by either the PSD or nonattainment requirements. The SIP limits were not in the PSD permit file for most sources, so no overall assessment could be made of additional emissions that would be permitted by the proposed regulations.

Overall cost savings to the sources as a result of meeting less stringent requirements could not be calculated without the knowledge of the SIP requirements. However, a few permit files for sources located in nonattainment areas did indicate the SIP limit. Examples of the emissions associated with these limits by industry category are in Table 27. The average for the few source categories for which information was available indicates that for the source not subject to the PSD and nonattainment requirements there would be an increase of 1.5 to 2 times the current emissions. However, most of these sources only have emissions of 25 to 50 tons per year, and therefore this twofold increase would still be less than the cutoff of 100 tons per year which would subject a source to nonattainment review.

TABLE 25. NEW AND MODIFIED SOURCES IN NONATTAINMENT AREAS NOT SUBJECT TO THE PROPOSED REGULATIONS

Source category	Not subject due to location		Not subject due to cutoffs	
	New	Modified	New	Modified
Fossil fuel-fired steam generator >250x10^6 Btu/h	2			
Coal-cleaning plant				
Portland cement plant	1	2	1	
Primary zinc smelter				
Iron and steel mill plant			1	
Primary bauxite smelter				
Primary copper smelter				
Municipal incinerator				
Hydrofluoric acid plant		1		
Sulfuric acid plant				
Nitric acid plant				
Lime plant	1	1	2	
Petroleum refinery	2	9	2	
Coke oven battery	2			
Phosphate rock processing plant				
Sulfur recovery plant			1	
Carbon black plant				
Primary lead smelter				
Secondary metal production plant		1	1	
Chemical process		1	1	
Industrial boiler >250x10^6 Btu/h				
Petroleum storage and transfer units			2	3
Taconite ore processing plant				
Kraft pulp mill				

(continued)

TABLE 25 (continued)

Source category	Not subject due to location		Not subject due to cutoffs	
	New	Modified	New	Modified
Glass fiber processing plant			1	
Charcoal production plant				
Fuel conversion plant				
Sintering plant				
Asphalt batch plant		2	5	
Rock crushing			1	
Natural gas compressor	1			
Mining				
Turbine	3			
Other	3	7	11	2
Total	15	24	29	5

TABLE 26. EMISSIONS FROM SOURCES LOCATED IN NONATTAINMENT AREAS THAT WOULD NOT BE SUBJECT TO THE PROPOSED REGULATIONS[a]

(Tons/yr)	PM	SO_2	VOC	CO	NO_x
	361	373	271	33.3	278

[a] Only includes those sources in the survey of PSD permits conducted as part of this analysis.

TABLE 27. SIP VERSUS PSD PERMIT LIMITS

Source category	PM			SO_2			VOC		
	SIP	PSD	Difference	SIP	PSD	Difference	SIP	PSD	Difference
Lime	42.6	15.3	27.3		40.3				
Fiberglass	14.0	11.2	2.8						
Cement	142.0	49.9	92.1		12.0				
Tape coating							91.4	54.0	37.4
Lead oxide	19.5	9.0	10.5						

Many of these sources, instead of increasing their emissions to the limit allowed, would use the additional reductions as future offset credit. Because these emissions represent only slight differences in control efficiency--99.9 percent for 50 tons per year and 99.8 percent for 100 tons per year--the associated cost savings would not be significant. This would not be true if the source decided to install a less efficient control device, but even then the source may install the same basic control equipment and operate it at less than its design efficiency to gain short-term energy savings until it decides to use the additional emission reduction (above those specfied in SIP or NSPS) as offset credit.

A source is considered to be subject to nonattainment review and therefore not subject to PSD review if it proposed to locate in an area designated as nonattainment for all the pollutants that it emitted. If it emitted any other pollutants for which the area were designated as attainment, it is considered to be still subject to PSD for those pollutants and therefore considered in the calculation of the total number of sources subject to the proposed regulations. Of the permits in the survey, 15 new and 24 modified sources would no longer be subject to PSD for a number of pollutants for which they are major. In some cases, the source would still be subject for some of the pollutants for which it was major because the area has not been designated as a nonattainment area for these pollutants. It is assumed that if a source were major for at least one pollutant that all other pollutants above the *de minimis* levels for which the area were designated as attainment would still be subject to PSD review. The number of sources subject to PSD review was not changed even if the criteria to subject a source to PSD review were any emissions rather than emissions above the *de minimis* levels for those other pollutants for which the area is designated as attainment. However, for a few of the sources, one or two additional pollutants would also be subject to PSD as well as the ones above the *de minimis* levels.

The associated emissions from the sources in the survey that would no longer be subject to PSD but would be subject to nonattainment review are in Table 28; only pollutants for which the area has been designated as nonattainment are included in the table.

TABLE 28. EMISSIONS SUBJECT TO NEW SOURCE NONATTAINMENT REQUIREMENTS BUT NOT TO PSD

(Tons/yr)	PM	SO_2	VOC	CO	NO_x
	10,788	10,985	2,084	1,834	1,761

Since many of the sources subject to the nonattainment area requirements have already indicated that they plan to install LAER, there would not be any additional cost as a result of the proposed regulations. However, there are a number of other sources located in nonattainment areas that were previously not subject to the nonattainment requirements which would now as a result of the proposed regulations be required to meet the nonattainment requirements.

Of the 39 sources in nonattainment areas subject to the proposed nonattainment new source review requirements, only 8 had applied LAER; the other 31 did not refer to the LAER limit in their PSD application, nor was LAER referred to in the permit file. These 31 sources could have demonstrated that they were in a clean pocket of a nonattainment area and thus were subject only to PSD, not the nonattainment requirements; or, that since they were applying for a PSD permit, they could have included only PSD information in the permit since the States would be (in most cases) responsible for the nonattainment new source review. However, the sources should have indicated in their PSD applications that they had or were in the process of obtaining a State permit and that they believed they were not subject to the nonattainment requirement and thus did not need to apply LAER.

The 31 sources not subject to the nonattainment requirements (i.e., those that did not mention LAER) would, under the proposed regulations, have to provide additional control beyond BACT (i.e., LAER) and to obtain the necessary offsets. Applying LAER instead of BACT would appear to be costly, but a review of the sources that had applied LAER revealed that (in many cases) the LAER limit was equal to the BACT limit. Therefore, these sources would not incur any additional control technology cost. A few sources indicated that the LAER limit was more stringent than the BACT limit, but because of limited data it was impossible to assign a cost for those few sources.

The cost of obtaining offsets for these sources could not be determined since no data were available on where these sources might obtain offsets. Past practices indicate that these sources would obtain internal rather than external offsets. Because most of the sources in nonattainment areas were modifications, they would likely obtain their offsets by replacing or closing down old polluting facilities or by meeting more stringent controls on the existing facilities. Little if any data are available on the costs of obtaining internal offsets since these vary significantly from source to source.

Although the 34 sources that would no longer be subject to PSD review and/or nonattainment review would obtain some cost savings as a result of the proposed regulations, the 31 sources that would now be subject to the more restrictive nonattainment requirements would incur some additional costs. Since the number of sources no longer subject to review (34) is very close to the number that would receive additional review (31) and the type of sources are very similar in each case, it was assumed, based on the limited data available, that the overall cost as a result of geographic applicability would be the same under the current and proposed requirements since the total savings under one would be offset by the costs imposed by the other.

APPENDIX A

MONITORING COSTS

TABLE A-1. SULFUR DIOXIDE MONITORING COSTS (1978 dollars)[1]

COSTS	Purchases			Labor			Total capital expenditure, $	Annualized cost, $[a]
	No. units	Cost, $	Total cost, $	Level/Rate, $/h	Hours	Cost, $		
Capital costs:								
Location:								
Selection				Professional/14.40	30	432	432	86
Negotiations[b]								
Easement payments[b]								
Equipment:								
Sampler/analyzers	1	6850	6850				6850	1,370
Calibration equipment[c]	1	8300	8300				1660	332
Telemetry/recorders	1	820	820				820	164
Shelters[d]								
Installation:								
Site preparation				Technician/11.50	6	69	69	14
Calibration of equipment				Professional/14.40	6	87	87	17
Other:								
Personnel/training[e]								
Support equipment[e] (gas regulators)	3	150	450				450	90
Spare parts (fiters, (pumps, etc.)		200					200	40
Operating costs:								
Fixed:								
Rent[f]								
Utilities (elec. and heat)		25/mo	300					300
Insurance/security								
Variable:								
Reagents	15	60	900					900
Zero and span gases	2	281	562					562
Other supplies (chart rolls)	25	10	250					250
Sample/data collection				Technician/11.50	520	5980		5,980
Maintenance and repair				Professional/14.40	40	576		576
Supervision and quality control								
Supervisory				Supervisor/21.20	78	1654		1,654
Quality control				Chemist/17.30	40	692		692
TOTAL							10,568	13,027

[a] Based on a 5-year amortization.

[b] Should be included if costs are incurred.

[c] Assumes calibration equipment will be used on 5 different analyzers.

[d] Accounted for in network costs.

[e] Included in burdened labor rate.

[f] Not included if monitor is on public property.

TABLE A-2. CARBON MONIXIDE MONITORING COSTS (1978 dollars)[1]

COSTS	Purchases			Labor			Total capital expenditure, $	Annualized cost, $[a]
	No. units	Cost, $	Total cost, $	Level/Rate, $/h	Hours	Cost, $		
Capital costs:								
Location:								
Selection				Professional/14.40	24	346	346	69
Negotiations[b]								
Easement payments[b]								
Equipment:								
Sampler/analyzers	1	6500	6500				6500	1300
Calibration equipment	1	9750	9750				1950[c]	390
Telemetry/recorders	1	820	820				820	164
Shelters[d]								
Installation:								
Site preparation				Technician/11.50	6	69	69	14
Calibration of equipment				Professional/14.40	6	87	87	17
Other:								
Personnel/training[e]								
Support equipment (gas regulators)	2	150	300				300	60
Spare parts								
Operating costs:								
Fixed:								
Rent[f]								
Utilities (elec. and heat)		25/mo	300					300
Insurance/security[f]								
Variable:								
Reagents								
Zero and span gases	2	263	526					526
Other supplies (chart rolls)	25	10	250					250
Sample/data collection				Technician/11.50	310	3565		3565
Maintenance and repair				Professional/14.40	100	1440		1440
Supervision and quality control								
Supervisory				Supervisor/21.20	78	1654		1654
Quality control				Chemist/17.30	40	692		692
TOTAL							10,072	10,441

[a] Based on 5-year amortization.

[b] Should be included if costs are incurred.

[c] Assuming the unit is used on 5 analyzers.

[d] Accounted for in network costs.

[e] Included in burdened labor rates.

[f] Not included if monitor is on public property.

TABLE A-3. NITROGEN DIOXIDE MONITORING COSTS (1978 dollars)[1]

COSTS	Purchases			Labor			Total capital expenditure, $	Annualized cost, $[a]
	No. units	Cost, $	Total cost, $	Level/Rate, $/h	Hours	Cost, $		
Capital costs:								
Location:								
Selection				Professional/14.40	24	346	346	69
Negotiations[b]								
Easement payments[b]								
Equipment:								
Sampler/analyzers	1	5870	5870				5870	1174
Calibration equipment	1	8300	8300				1660[c]	332
Telemetry/recorders	1	820	820				820	164
Shelters[d]								
Installation:								
Site preparation				Technician/11.50	6	69	69	14
Calibration of equipment				Professional/14.40	6	87	87	17
Other:								
Personnel/training[e]								
Support equipment (gas regulators)[e]	2	150	300				300	60
Spare parts								
Operating costs:								
Fixed:								
Rent[f]								
Utilities (elec. and heat)		25/mo	300					300
Insurance/security[f]								
Variable:								
Reagents								
Zero and span gases	2	263	526					526
Other supplies (chart rolls)	25	10	250					250
Sample/data collection				Technician/11.50	260	2990		2990
Maintenance and repair				Professional/14.40	80	1152		1152
Supervision and quality control								
Supervisory				Supervisor/21.20	78	1654		1654
Quality control				Chemist/17.30	40	692		692
TOTAL							9152	9394

[a] Based on 5-year amortization.

[b] Should be included if costs are incurred.

[c] Assuming the unit is used on 5 analyzers.

[d] Accounted for in network costs.

[e] Included in burdened labor rate.

[f] Not included if monitor is on public property.

TABLE A-4. OZONE MONITORING COSTS
(1978 dollars)

COSTS	Purchases			Labor			Total capital expenditure, $	Annualized cost, $[a]
	No. units	Cost, $	Total cost, $	Level/Rate, $/h	Hours	Cost, $		
Capital costs:								
Location:								
Selection				Professional/14.40	24	346	346	69
Negotiations[b]								
Easement payments[b]								
Equipment:								
Sampler/analyzers	1	4500	4500				4500	900
Calibration equipment	1	8300	8300				1660[c]	332
Telemetry/recorders	1	820	820				820	164
Shelters[d]								
Installation:								
Site preparation				Technician/11.50	6	69	69	14
Calibration of equipment				Professional/14.40	6	87	87	17
Other:								
Personnel/training[e]								
Support equipment (gas regulators)	3	150	450				450	90
Spare parts								
Operating costs:								
Fixed:								
Rent[f]								
Utilities (elec. and heat)		25/mo	300					300
Insurance/security[f]								
Variable:								
Reagents	2	100	200					200
Zero and span gases	2	281	562					562
Other supplies (chart rolls)	25	10	250					250
Sample/data collection				Technician/11.50	260	2990		2990
Maintenance and repair				Professional/14.40	80	1152		1152
Supervision and quality control								
Supervisory				Supervisor/21.20	78	1654		1654
Quality control				Chemist/17.30	40	692		692
TOTAL							7932	9386

[a] Based on 5-year amortization.

[b] Should be included if costs are incurred.

[c] Assuming unit is used on five analyzers.

[d] Accounted for in network costs.

[e] Included in burdened labor rate.

[f] Not included if monitor is on public property.

TABLE A-5. TOTAL SUSPENDED PARTICULATES MONITORING COSTS[a] (1978 dollars)[1]

COSTS	Purchases			Labor			Total capital expenditure, $	Annualized cost, $[b]
	No. units	Cost, $	Total cost, $	Level/Rate, $/h	Hours	Cost, $		
Capital costs:								
Location:								
Selection				Professional/14.40	24	346	346	69
Negotiations[c]								
Easement payments[c]								
Equipment:								
Sampler/analyzers	1	512	512				512	102
Calibration equipment	1	170	170				21[d]	4
Telemetry/recorders								
Shelters[e]								
Installation:								
Site preparation				Technician/11.50	4	46	46	9
Calibration of equipment				Professional/14.40	4	58	58	12
Other:								
Personnel/training[f]								
Support equipment[f]								
Spare parts (pumps, etc.)		25					25	5
Operating costs:								
Fixed:								
Rent[g]								
Utilities (elec. and heat)		10/mo	120					120
Insurance/security[g]								
Variable:								
Filters	1	25	25					25
Other supplies								
Sample/data collection				Technician/11.50	61	702		702
Maintenance and repair				Professional/14.40	18	259		259
Supervision and quality control								
Supervisory				Supervisor/21.20	8	170		170
Quality control				Chemist/17.30	8	138		138
TOTAL							1,008	1,615

[a] Assumes 61 samples per year.

[b] Amortized over 5 years.

[c] Should be included if costs are incurred.

[d] Assumes calibration equipment will be used on eight different samplers.

[e] Accounted for in network costs.

[f] Included in burdened labor rate.

[g] Not included if monitor is on public property.

TABLE A-6. NETWORK CODE (A)
SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x) =	$ 3230
NOx	2	x $ 9394	= $	- (% x $ x) =	$ 18788
SO_2	3	x $ 13027	= $	- (% x $ x) =	$ 39081
CO	3	x $ 10441	= $	- (% x $ x) =	$ 31323
Be		x $ 762.50	= $	- (% x $ x) =	$ 762.50
Hg		x $ 1220.	= $	- (% x $ x) =	$ 1220.0
	Subtotal				94404.50

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷	$
[✓ 16.0 x 8.0]	3	x $ 3000	÷	$ 9000
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
	Subtotal			9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $	wage rate/h = $
	x	x	= (÷ mph) x $	wage rate/h = $
	Subtotal Total annualized network cost			600*

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and [illegible]%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$104,004.50

TABLE A-7. NETWORK CODE (B)

. . SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x) =	$ 3230
NO_2	2	x $ 9394	= $	- (% x $ x) =	$ 18788
SO_2	3	x $ 13027	= $	- (% x $ x) =	$ 39,081
CO	3	x $ 10441	= $	- (% x $ x) =	$ 31323
		x $	= $	- (% x $ x) =	$
Subtotal					92422

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷	$
~~16.0 x 8.0~~	3	x $ 3000	÷	$ 9000
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $	wage rate/h = $
	x	x	= (÷ mph) x $	wage rate/h = $
Subtotal Total annualized network cost				600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$102,022

TABLE A-8. NETWORK CODE (C)
SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	− (% x $ x) =	$ 3230
NO_x	2	x $ 9394	= $	− (% x $ x) =	$ 18788
		x $	= $	− (% x $ x) =	$
SO_2	3	x $ 13027	= $	− (% x $ x) =	$ 39081
		x $	= $	− (% x $ x) =	$
		x $	= $	− (% x $ x) =	$
	Subtotal				61099

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $ ÷		$
7.0 x 7.0		x $ ÷		$
~~16.0 x 8.0~~	3	x $ 3000 ÷		$
32.0 x 8.0		x $ ÷		$
Other		x $ ÷		$
	Subtotal			9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $	wage rate/h = $
	x	x	= (÷ mph) x $	wage rate/h = $
Subtotal Total annualized network cost				600✓

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

70699

TABLE A-9. NETWORK CODE (D)

. SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
NO_x	2	x $ 9394	= $	- (% x $ x)	= $ 18788
		x $	= $	- (% x $ x)	= $
CO	3	x $ 10441	= $	- (% x $ x)	= $ 31323
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
	Subtotal				56111

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $ ÷		$
7.0 x 7.0		x $ ÷		$
~~16.0 x 8.0~~	3	x $ 5000 ÷		$
32.0 x 8.0		x $ ÷		$
Other		x $ ÷		$
	Subtotal			[illegible]

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage
Vehicle operation	x	x	= x 0. /mile = $
	x	x	= x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $ wage rate/h = $
	x	x	= (÷ mph) x $ wage rate/h = $
	Subtotal Total annualized network cost		[illegible]

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

59,711

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TABLE A-10. NETWORK CODE (E)
SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
SO_2	3	x $ 13027	= $	- (% x $ x)	= $ 39081
NOx	2	x $ 9394	= $	- (% x $ x)	= $ 18788
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
Subtotal					57869

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0	3	x $	÷	$
~~16.0 x 8.0~~		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				3000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $	wage rate/h = $
	x	x	= (÷ mph) x $	wage rate/h = $
Subtotal Total annualized network cost				600*

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

67,469

TABLE A-11. NETWORK CODE (F)

. SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
NOx	2	x $ 9394	= $	– (% x $ x)	= $
		x $	= $	– (% x $ x)	= $ 18788
		x $	= $	– (% x $ x)	= $
		x $	= $	– (% x $ x)	= $
		x $	= $	– (% x $ x)	= $
		x $	= $	– (% x $ x)	= $
		x $	= $	– (% x $ x)	= $
	Subtotal				18788

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0	2	x $ 2300	÷	$
16.0 x 8.0		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
	Subtotal			4600

Travel costs

	No. of stations	Average distance, miles	No. of visits per year	= Yearly mileage
Vehicle operation	x	x		= x 0. /mile = $
	x	x		= x 0. /mile = $
Labor cost	x	x		= (÷ mph) x $ wage rate/h = $
	x	x		= (÷ mph) x $ wage rate/h = $
	Subtotal Total annualized network cost			600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

TABLE A-12. NETWORK CODE (G)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations		Annualized station cost[a]		Subtotal		Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)		Total annualized costs[c] (per pollutant monitored)
TSP	2	x	$ 1615	=	$	-	(% x $ x)	=	$ 3230
SO2	3	x	$ 9394	=	$	-	(% x $ x)	=	$ 18788
NOx	2	x	$ 13027	=	$	-	(% x $ x)	=	$ 39081
Be	✓	x	$ 76250	=	$	-	(% x $ x)	=	$ 762.50
		x	$	=	$	-	(% x $ x)	=	$
		x	$	=	$	-	(% x $ x)	=	$
Subtotal									61861.50

Shelter costs

Shelter size, ft	No. of shelters		Cost per shelter		Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x	$	÷		$
~~7.0 x 7.0~~		x	$	÷		$
[✓ 6.0 x 8.0]	3	x	$ 3000	÷		$
12.0 x 8.0		x	$	÷		$
Other		x	$	÷		$
Subtotal						9000

Travel costs

	No. of stations		Average distance, miles		No. of visits per year = Yearly mileage	
Vehicle operation		x		x	=	x 0. /mile = $
		x		x	=	x 0. /mile = $
Labor cost		x		x	= (÷ mph) x $	wage rate/h = $
		x		x	= (÷ mph) x $	wage rate/h = $
Subtotal Total annualized network cost						600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

71,461.50

TABLE A-13. NETWORK CODE (H)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x)	= $ 3230
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
Subtotal					3230

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷	$
16.0 x 8.0		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage		
Vehicle operation	x	x	=	x 0. /mile	= $
	x	x	=	x 0. /mile	= $
Labor cost	x	x	= (÷	mph) x $	wage rate/h = $
	x	x	= (÷	mph) x $	wage rate/h = $
Subtotal Total annualized network cost					600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

3830

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TABLE A-14. NETWORK CODE (I)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations		Annualized station cost[a]		Subtotal		Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)		Total annualized costs[c] (per pollutant monitored)
TSP	2	x	$ 16.15	=	$	-	(% x $ x)	=	$ 3230
NOx	2	x	$ 9394	=	$	-	(% x $ x)	=	$ 18788
SO_2	3	x	$ 13027	=	$	-	(% x $ x)	=	$ 39081
CO	3	x	$ 10441	=	$	-	(% x $ x)	=	$ [illegible]
Be		x	$ 762.5	=	$	-	(% x $ x)	=	$ [illegible]
Subtotal									93184.50

Shelter costs

Shelter size, ft	No. of shelters		Cost per shelter		Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x	$	÷		$
7.0 x 7.0		x	$	÷		$
16.0 x 8.0	3	x	$ 3000	÷		$
32.0 x 8.0		x	$	÷		$
Other		x	$	÷		$
Subtotal						9000

Travel costs

	No. of stations		Average distance, miles		No. of visits per year = Yearly mileage		
Vehicle operation		x		x	=	x 0. /mile	= $
		x		x	=	x 0. /mile	= $
Labor cost		x		x	= (÷ mph) x $	wage rate/h	= $
		x		x	= (÷ mph) x $	wage rate/h	= $
Subtotal Total annualized network cost							600#

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

102,784.50

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TABLE A-15. NETWORK CODE (J)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations		Annualized station cost[a]		Subtotal		Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)		Total annualized costs[c] (per pollutant monitored)
NO_x	2	x	$ 9394	=	$	-	(% x $ x)	=	$ 18788
		x	$	=	$	-	(% x $ x)	=	$ 3230
TSP	2	x	$ 1615	=	$	-	(% x $ x)	=	$
		x	$	=	$	-	(% x $ x)	=	$
		x	$	=	$	-	(% x $ x)	=	$
		x	$	=	$	-	(% x $ x)	=	$
		x	$	=	$	-	(% x $ x)	=	$
	Subtotal								22018

Shelter costs

Shelter size, ft	No. of shelters		Cost per shelter		Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x	$	÷		$
7.0 x 7.0		x	$	÷		$
~~16.0 x 8.0~~	2	x	$ 2300	÷		$
32.0 x 8.0		x	$	÷		$
Other		x	$	÷		$
	Subtotal					4600

Travel costs

	No. of stations		Average distance, miles		No. of visits per year	= Yearly mileage		
Vehicle operation		x		x		=	x 0. /mile	= $
		x		x		=	x 0. /mile	= $
Labor cost		x		x		= (÷ mph)	x $ wage rate/h	= $
		x		x		= (÷ mph)	x $ wage rate/h	= $
	Subtotal Total annualized network cost							600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$ 27,218.-

TABLE A-16. NETWORK CODE (K)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x)	= $ 3230
		x $	= $	- (% x $ x)	= $
SO$_2$	3	x $ 13027	= $	- (% x $ x)	= $ 39081
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
Subtotal					42311

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
~~3.5 x 4.0~~		x $	÷	$
7.0 x 7.0	3	x $ 2300	÷	$
16.0 x 8.0		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				4900

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷	mph) x $ wage rate/h = $
	x	x	= (÷	mph) x $ wage rate/h = $
Subtotal Total annualized network cost				600

$ 47,811.

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

TABLE A-17. NETWORK CODE (L)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
SO$_2$	3	x $ 13027	= $	- (% x $ x)	= $ 39081
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
	Subtotal				39081

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0	3	x $ 2300	÷	$
16.0 x 8.0		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
	Subtotal			6900

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷	mph) x $ wage rate/h = $
	x	x	= (÷	mph) x $ wage rate/h = $
	Subtotal Total annualized network cost			600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

46,581

TABLE A-18. NETWORK CODE (M)

. SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x)	= $ 3230
		x $	= $	- (% x $ x)	= $
CO	3	x $ 10441	= $	- (% x $ x)	= $ 31323
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
	Subtotal				34553

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0	x	$	÷	$
[✓ 7.0 x 7.0]	3 x	$ 2300	÷	$
16.0 x 8.0	x	$	÷	$
32.0 x 8.0	x	$	÷	$
Other	x	$	÷	$
	Subtotal			6900

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage
Vehicle operation	x	x	= x 0. /mile = $
	x	x	= x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $ wage rate/h = $
	x	x	= (÷ mph) x $ wage rate/h = $
Subtotal Total annualized network cost			600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$42,053.

TABLE A-19. NETWORK CODE (N)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x)	= $ 3230
Pb		x $	= $	- (% x $ x)	= $
		x $ 671	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $ 671
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
	Subtotal				3901

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0	x	$	÷	$
7.0 x 7.0	x	$	÷	$
16.0 x 8.0	x	$	÷	$
32.0 x 8.0	x	$	÷	$
Other	x	$	÷	$
	Subtotal			

Travel costs

	No. of stations	Average distance, miles	No. of visits per year	= Yearly mileage		
Vehicle operation	x	x		=	x 0. /mile	= $
	x	x		=	x 0. /mile	= $
Labor cost	x	x		= (÷ mph)	x $ wage rate/h	= $
	x	x		= (÷ mph)	x $ wage rate/h	= $
	Subtotal Total annualized network cost				600	

$4,501,

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

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TABLE A-20. NETWORK CODE (O)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
NO_x	2	x $ 9394	= $	- (% x $ x)	= $ 18788
		x $	= $	- (% x $ x)	= $
SO_2	3	x $ 13027	= $	- (% x $ x)	= $ 39081
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
	Subtotal				57869

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0	3	x $ 3000	÷	$
16.0 x 8.0		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷	mph) x $ wage rate/h = $
	x	x	= (÷	mph) x $ wage rate/h = $
Subtotal Total annualized network cost				600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$ 67,469

TABLE A-21. NETWORK CODE (P)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
CO	3	x $ 16441	= $	- (% x $ x) =	$ 31323
TSP	2	x $ 1615	= $	- (% x $ x) =	$ 3230
SO_2	3	x $ 13027	= $	- (% x $ x) =	$ 39081
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
Subtotal					73,634.

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷	$
~~16.0 x 8.0~~	3	x $ 3000	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage
Vehicle operation	x	x	= x 0. /mile = $
	x	x	= x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $ wage rate/h = $
	x	x	= (÷ mph) x $ wage rate/h = $
Subtotal Total annualized network cost			600

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$83,234

TABLE A-22. NETWORK CODE (Q)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x) =	$ 3230
NOx	2	x $ 9394	= $	- (% x $ x) =	$ 18788
		x $	= $	- (% x $ x) =	$
SO2	3	x $ 13027	= $	- (% x $ x) =	$ 39081
Be		x $ 762.50	= $	- (% x $ x) =	$ 762.50
Hg		x $ 1220	= $	- (% x $ x) =	$ 1220
	Subtotal				63,081.50

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
~~7.0 x 7.0~~		x $	÷	$
~~16.0 x 8.0~~	3	x $ 3000	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
	Subtotal			3000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage
Vehicle operation	x	x	= x 0. /mile = $
	x	x	= x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $ wage rate/h = $
	x	x	= (÷ mph) x $ wage rate/h = $
	Subtotal Total annualized network cost		600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$ 72,681.50

TABLE A-23. NETWORK CODE (R)
. SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
CO	3	x $ 10441	= $	− (% x $ x)	= $ 31323
		x $	= $	− (% x $ x)	= $
NOx	2	x $ 9394	= $	− (% x $ x)	= $ 18788
		x $	= $	− (% x $ x)	= $
SO_2	3	x $ 13027	= $	− (% x $ x)	= $ 39081
		x $	= $	− (% x $ x)	= $
		x $	= $	− (% x $ x)	= $
Subtotal					89192

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷	$
[✓ 15.0 x 8.0]	3	x $ 3000	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $ wage rate/h = $	
	x	x	= (÷ mph) x $ wage rate/h = $	
Subtotal Total annualized network cost				600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$ 98,792

TABLE A-24. NETWORK CODE (S)
SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs (per pollutant monitored)
CO	3	x $ 10441	= $	- (% x $ x)	= $ 31328
		x $	= $	- (% x $ x)	= $
NOx	2	x $ 9394	= $	- (% x $ x)	= $ 18788
		x $	= $	- (% x $ x)	= $
TSP	2	x $ 1615	= $	- (% x $ x)	= $ 3230
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
	Subtotal				53346

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷	$
~~16.0 x 8.0~~		x $	÷	$
32.0 x 8.0	3	x $ 3000	÷	$
Other		x $	÷	$
	Subtotal			9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $	wage rate/h = $
	x	x	= (÷ mph) x $	wage rate/h = $
	Subtotal Total annualized network cost			600

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$62,944.

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TABLE A-25. NETWORK CODE (T)
. SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
3	SO$_2$	x $ 13027	= $	- (% x $ x) =	$ 39081
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
	Subtotal				

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
[✓ 7.0 x 7.0]	3	x $ 2300	÷	$
16.0 x 8.0		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				4900

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷	mph) x $ wage rate/h = $
	x	x	= (÷	mph) x $ wage rate/h = $
Subtotal Total annualized network cost				600

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 10%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$44,581

TABLE A-26. NETWORK CODE (U)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
SO_2	3	x $13027	= $	- (% x $ x) =	$39081
		x $	= $	- (% x $ x) =	$
CO	3	x $10441	= $	- (% x $ x) =	$31328
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
		x $	= $	- (% x $ x) =	$
	Subtotal				70409

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷	$
16.0 x 8.0	3	x $3000	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
	Subtotal			9000

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage	
Vehicle operation	x	x	=	x 0. /mile = $
	x	x	=	x 0. /mile = $
Labor cost	x	x	= (÷	mph) x $ wage rate/h = $
	x	x	= (÷	mph) x $ wage rate/h = $
	Subtotal Total annualized network cost			600

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$ 80,009.

TABLE A-27. NETWORK CODE (V)

SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
SO_2	3	x $ 13027	= $	- (% x $ x)	= $ 39081
NO_2	2	x $ 9394	= $	- (% x $ x)	= $ 18788
		x $	= $	- (% x $ x)	= $
Be		x $ 762.50	= $	- (% x $ x)	= $ 762.50
		x $	= $	- (% x $ x)	= $
Hg		x $ 1220.	= $	- (% x $ x)	= $ 1220.
	Subtotal				59,851.50

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
3.5 x 4.0		x $	÷	$
7.0 x 7.0		x $	÷ 9000	$
16.0 x 8.0	3	x $ 3000	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
Subtotal				[illegible]

Travel costs

	No. of stations	Average distance, miles	No. of visits per year = Yearly mileage
Vehicle operation	x	x	= x 0. /mile = $
	x	x	= x 0. /mile = $
Labor cost	x	x	= (÷ mph) x $ wage rate/h = $
	x	x	= (÷ mph) x $ wage rate/h = $
Subtotal Total annualized network cost			606

$ 69,451.50

---

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

TABLE A-28. NETWORK CODE (W)
SAMPLE CALCULATION SHEET FOR ANNUALIZED COSTS OF AIR MONITORING NETWORK

Annualized station costs (per pollutant monitored), before adjustment

Pollutant monitored	No. of stations	Annualized station cost[a]	Subtotal	Quantity discount[b] (% x annualized equipment cost[c] x no. of stations)	Total annualized costs[c] (per pollutant monitored)
TSP	2	x $ 1615	= $	- (% x $ x)	= $ 3230
		x $	= $	- (% x $ x)	= $
SO_2	3	x $ 13027	= $	- (% x $ x)	= $ 39081
		x $	= $	- (% x $ x)	= $
Be		x $ 762.50	= $	- (% x $ x)	= $ 762.50
		x $	= $	- (% x $ x)	= $
		x $	= $	- (% x $ x)	= $
	Subtotal				43,073.50

Shelter costs

Shelter size, ft	No. of shelters	Cost per shelter	Depreciation period, years[d]	Annualized shelter costs
~~3.5 x 4.0~~		x $	÷	$
~~7.0 x 7.0~~	3	x $ 2300	÷	$
16.0 x 8.0		x $	÷	$
32.0 x 8.0		x $	÷	$
Other		x $	÷	$
	Subtotal			6900

Travel costs

	No. of stations	Average distance, miles	No. of visits per year	= Yearly mileage	
Vehicle operation		x	x	=	x 0. /mile = $
		x	x	=	x 0. /mile = $
Labor cost		x	x	= (÷ mph) x $	wage rate/h = $
		x	x	= (÷ mph) x $	wage rate/h = $
	Subtotal Total annualized network cost				600

[a] Costs obtained from individual tables in Section 3.0.

[b] Dependent on vendor and quantity, but generally between 2% and 18%.

[c] Annualized equipment costs obtained from individual tables in Section 3.0.

[d] Assumes 5 years.

$ 50,573.50

APPENDIX B

COSTS INCURRED BY MODIFICATIONS NOT CURRENTLY SUBJECT TO THE JUNE 19, 1978 PSD REGULATIONS AS A RESULT OF THE PROPOSED PSD REGULATIONS

APPENDIX B

COSTS INCURRED BY MODIFICATIONS NOT CURRENTLY SUBJECT TO THE JUNE 19, 1978 PSD REGULATIONS AS A RESULT OF THE PROPOSED PSD REGULATIONS

CURRENT PROPOSAL

Based on the estimates available from Section 4 approximately 1200 modifications per year which are not currently subject to the PSD regulations would be subject to the proposed regulations as a result of these modifications increasing the net emissions by more than the proposed de minimis emission levels. As a result of these modifications being subject to PSD review they would incur some additional costs over and above the current costs to obtain a general State New Source Review permit.

Because these sources are subject to PSD review they would be required to

1. Conduct an air quality assessment of the impact of the proposed modification using an air quality dispersion model,
2. conduct preconstruction monitoring,
3. prepare a PSD permit
4. undergo review and incur additional costs as a result of delay in construction, and
5. install BACT.

Modeling

Since these sources would be relatively small in terms of emissions they could use a PTMAX type model. At a cost of $1500 per source the total cost for these sources would be $\$1.8 \times 10^6$ (1200 x $1500).

Monitoring

Since these would be modifications to existing sources, it is assumed that existing monitoring data in the vicinity of the

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TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-450/2-80-073	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Regulatory Impact Assessment for the September 5, 1979 Proposed Regulations for Prevention of Significant Deterioration		5. REPORT DATE June '80 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) David Dunbar, Barbara Blagun, Larry Gibbs, Joe Carvetti, Jack Wunderle		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS PEDCo Environmental Inc. Durham, NC 27701		10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO. 68-02-3173 Task 1
12. SPONSORING AGENCY NAME AND ADDRESS U.S. EPA Office of Air Quality Planning and Standards Research Triangle Park, N.C. 27711		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Report provides a relative impact assessment of several proposed changes to the current prevention of significant deterioration (PSD) regulations. These changes fundamentally affect what sources and modifications must obtain a PSD permit before constructing. The changes include revisions to the definitions of "potential to emit", "baseline concentration", and "major modifications", additional monitoring and BACT requirements, and the inclusion of certain minimum size cutoff for exempting projects from PSD review. The existing regulations and the proposal were compared in terms of number and size of sources subject to review, amount of emissions captured, degree of air quality deterioration, and estimated review costs.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
PSD Regulatory Assessment		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 147
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE is more stringent than the SIP limit, approximately 43 modifications would be subject to the more stringent controls as a result of the BACT requirement than under the SIP. This additional cost would amount to approximately \$4.3 to 8.6 x 10^6 per year. Therefore, the additional costs of BACT as a result of additional modifications being subject to review is approximately 12 to 24 x 10^6 per year.

MODIFIED DE MINIMIS EMISSION LEVELS

Since only a limited amount of information is available regarding the number of additional modifications which are currently not subject to PSD review, information on the 151 modifications which have received permits was used to obtain an estimate of the number of additional modifications which would be subject if the current de minimis levels were revised to 25 TPY for TSP, and 40 TPY for SO_2, HO_x and HC. The CO de minimis level would remain the same. Based on this information, approximately 888 (see Section 4.5) out of the 1200 additional modifications would be subject to review. Given this estimate the following costs were calculated:

Modeling

888 x \$1500 = 1.3 x 10^6

Monitoring

No additional cost.

Preparation of Permit

888 x \$4300 = 3.8 x 10^6

Review Time

888 x \$5832 = 5.2 x 10^6

BACT

(1200)(.32) = 384 No Longer Subject

If there are 432 sources less than 50 tons per year and of these 384 would no longer be subject, then only 48 of the 432 sources less than 50 tons per year would be required to apply BACT. If 10% of these sources which remain subject would be required to meet an emission limit under BACT that would be more stringent than the SIP, then the additional cost would be on the order of \$.5 to \$1 x 10^6. By the same token, if 10% of the modification with emissions greater than 50 tons per year would be required to meet an emission limit under BACT that would be more stringent than the SIP, then the additional cost would be \$7.7 to \$15.4 x 10^6. Total additional cost would be \$8.2 to \$16.4 x 10^6 per year.

source could be used instead of establishing a monitoring network and thus no additional cost would be incurred as a result of preconstruction or postconstruction monitoring.

Preparation of PSD Permit

Since these modifications would be subject to PSD they would be required to prepare a PSD permit application which would require that slightly more information be gathered than would be needed for a NSR permit. Based on the amount of information needed to obtain a PSD permit, a minimum of 123 man-hours is needed to collect the information and submit the PSD permit application. Assuming a burden labor cost of $35 per hour, the total cost would be $4300 per permit or approximately $\$5.2 \times 10^6$ per year assuming 1200 permits would be issued per year.

Review Time

Since these sources would be required to obtain a PSD permit in addition to a NSR permit, some additional review time would be incurred which would cause some further delays in construction. Based on information in Section 3, this delay would cost approximately $8750 for a review time of 3 months or $2916 per month. If the minimum time for obtaining a permit is 3 months and one month is needed to obtain a State permit then 2 months of the 3 month period is due solely to PSD review. This two month review would cost approximately $5832 ($2916 x 2) and would amount to approximately $\$6.9 \times 10^6$ for the 1200 permits.

BACT

Based on the estimates in Section 4, approximately 768 of the 1200 modifications would be greater than 50 tons per year and 432 would be less than 50 tons per year. As a result of a review of the sources which would have controlled emissions less than 100/250 tons per year and therefore would not be subject to PSD review based on the proposed regulations, it was determined that approximately 10% of the sources with emissions greater than 50 tons per year (but less than 100/250 tons per year) had emission limits as a result of BACT which would be more stringent than those emission limits required by the SIP. If this same percentage holds true for these additional modifications, then approximately 77 modifications would incur some additional costs as a result of being required to meet a BACT instead of a SIP limit. This cost would amount to approximately $\$7.7$ to 15.4×10^6 per year. Additionally, the modifications with emissions less than 50 tons per year would also be subject to the BACT. Based on the information above regarding the number of modifications where the BACT

APPENDIX C

SUMMARY OF THE ASSESSMENT OF THE SEPTEMBER 5, 1979 PROPOSED PSD REGULATIONS

BEST DOCUMENT AVAILABLE

SUMMARY OF THE ASSESSMENT OF THE SEPTEMBER 5, 1979 PROPOSED PSD REGULATION

Regulations (alternative)	Number subject per year		Number not subject per year		Cost, 10^6 dollars/year									
	New	Modified	New	Modified	Additional modification subject per year	Modeling	Preconstruction monitoring	Postconstruction monitoring	Permit preparation	Review time	Preconstruction notice	No longer subject to BACT	Additional BACT	Total
Current[a]	268	113				3.9	0.3		3.0 to 6.2					
Proposal based on current permits[a]	95	84	163	26		3.0	0.6- 8.0	2.3	1.4 to 2.9	-4.4	0.1	-1.9 to -3.7		
Difference compared with current						-0.9	0.3- 7.7	2.3	-1.6 to-3.3	-4.4	0.1	-1.9 to -3.7		-2.2 to -6.1
Proposal based on all sources[b]	95	84			1200	4.8	0.6- 8.0	2.3	6.6 to 8.1	2.5	0.1	-1.9 to -3.7	12.0 to 24.0	
Difference compared with current						0.9	0.3- 7.7	2.3	1.9 to 3.6	2.5	0.1	-1.9 to -3.7	12.0 to 24.0	19.8 to 35.7
Modified *de minimis* levels based on all sources	95	69			888	4.3	0.6- 8.0	2.3	5.2 to 6.7	0.8	0.1	-1.9 to -3.7	8.2 to 16.4	
Difference compared with current						0.4	0.3- 7.7	2.3	0.5 to 2.2	0.8	0.1	-1.9 to -3.7	8.2 to 16.4	12.4 to 24.5

[a] Current permits are those contained in the survey of PSD permits issued from April 1, 1978, to November 1, 1979, calculated on a yearly basis (604 x 12/19 = 381), and are representative of the type and number of sources that would receive permits in the future. The total of the number of sources subject plus the number of sources not subject based on the proposal does not equal the total number of sources subject under the current regulations because 22 sources (13 sources when converted to a yearly basis 22 x 12/19 = 13) could not be categorized in terms of applicability based on the data obtained during the survey of the permits.

[b] All permits include those contained in the survey of PSD permits issued from April 1, 1978 to November 1, 1979, and other sources not currently subject to PSD that would be subject based on the proposal.

[c] TSP = 25 tons/year
SO_2, NO_x, HC = 40 tons/year
CO = 100 tons/year